US Army Corps
of Engineers
HUNTSVILLE DIVISION

Defense Environmental Restoration Program
for
Formerly Used Defense Sites

Ordnance and Explosive Waste
Chemical Warfare Materials

ARCHIVES SEARCH REPORT

FINDINGS

CAMP ABBOT

Deschutes County, Oregon

Project No. F10OR004102

JULY 1995

Prepared by
US ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT

ORDNANCE AND EXPLOSIVE WASTE
CHEMICAL WARFARE MATERIALS
ARCHIVES SEARCH REPORT
FINDINGS
FOR
CAMP ABBOT
Deschutes County, Oregon

Project No. F10OR004102

TABLE OF CONTENTS

APPENDICES

REPORT PLATES

1.0 Introduction

1.1 Authority

In 1986, Congress established the Defense Environmental Restoration Program at 10 U.S.C. 2701 et.seq. This program directed the Secretary of Defense to "carry out a program of environmental restoration at facilities under the jurisdiction of the Secretary."

In March, 1990, the EPA issued a revised National Contingency Plan. Under 40 C.F.R. 300.120, EPA designated DOD to be the removal response authority for incidents involving DoD military weapons and munitions under the jurisdiction, custody and control of DoD.

Since the beginning of this program, the U.S. Army Corps of Engineers has been the agency responsible for environmental restoration at Formerly-Used Defense Sites (FUDS). Since 1990, the U.S. Army Engineering and Support Center, Huntsville, has been the Mandatory Center of Expertise and Design Center for Ordnance and Explosives.

On April 5, 1990, U.S. Army Engineer Division, Huntsville (USAEDH) was designated as the USACE Mandatory Center of Expertise (MCX) and Design Center for Ordnance and Explosive Waste (OEW). As the MCX and Design Center for OEW, USAEDH is responsible for the design and successful implementation of all Department of the Army OEW remediations required by CERCLA. USAEDH will also design and implement OEW remediation programs for other branches of the Department of Defense when requested. In cooperation with the Huntsville Division, the U.S. Army Corps of Engineers St. Louis District has been assigned the task of preparing Archives Search Reports for those Formerly Used Defense Sites (FUDS) suspected of ordnance and explosive waste (OEW) and chemical warfare materials (CWM) contamination.

1.2 Subject

The former Camp Abbot installation was a World War II Army Engineering Replacement and Training Center. The site, located in Deschutes County, Oregon, consisted of several small arms firing ranges, grenade and artillery ranges, ordnance storage magazines and support facilities, and a gas chamber for training. Various documents refer to the site as Camp Abbott.

1.3 Purpose

This Archives Search Report (ASR) compiles information obtained through historical research at various archives and records holding facilities, interviews with persons associated with the site or its operations, and personal visits to the site. All efforts were directed towards determining possible use or disposal of ordnance and/or CWM on the site. Particular emphasis was placed on establishing the type of munitions, quantities and area of disposal. Information obtained during this process was used in developing recommendations for further actions at the site.

1.4 Scope

The entire site of the former military installation, consisting of 9686.41 acres, was evaluated in assessing the potential for OEW contamination. It is designated as DERP-FUDS Site No. F10OR004100.

This report presents the history of the site, description and characterization of the immediate surrounding area, real estate ownership information, findings of a visual field survey, and OEW (CWM) site analysis, including an evaluation of potential ordnance contamination. A separate **Executive Summary** supplements these ASR FINDINGS and furnishes the CONCLUSIONS and RECOMMENDATIONS.

2.0 Previous Site Investigations

2.1 Corps of Engineers Documents

Under the Defense Environmental Restoration Program (DERP), the Portland District prepared a Findings and Determination of Eligibility (FDE), for the subject Camp Abbot, dated 31 January 1986. The FDE states that the installation, which was activated in May 1943, served as an engineering replacement and training center. Based on the recovery of ordnance and the presence of small arms, artillery, and grenade practice ranges, an OEW project was proposed. The District assigned a RAC of 2 to this site.

No mention of Certificates of Clearance for the ranges was included, nor did any of the real estate records examined contain OEW related land use restrictions. A copy of the FDE is included at Appendix D-1.

3.0 Site and Site Area Description

3.1 Land Usage

3.1.1 Location

The former Camp Abbot installation is located in Deschutes County, Oregon, west of the community of Sunriver. The site, approximately 15 miles south of Bend, Oregon, is bordered on the west by U.S. Highway 97 and straddles the Deschutes River. The portion of the former site situated east of the Deschutes River was developed as part of the Sunriver Resort.

3.1.2 Past Use

Prior to DOD acquiring the land, it was utilized primarily for timber harvesting. Two small farming operations also existed on the site.

3.1.3 Current Uses

Presently, the planned development community of Sunriver Resort is situated on the eastern portion of the site. The lands west of the Deschutes River are under the control of the Forest Service and are virtually undeveloped.

3.2 Climatic Data

Normal airmasses move into the area from the Pacific Ocean. This air gives up most of its moisture after crossing the Coastal Range and then the Cascade Mountains. This leaves very dry air which flows into the Central Oregon plateau. It has a dry season and warm temperatures in summer, a cold and slightly wetter winter, and a wide range in temperature.

Average annual precipitation is about 11 inches a year. Approximately 33 percent of this annual total occurs during the period December through February; 26 percent March through May; 15 percent in June through August, and 26 percent September through November. Thunderstorms have occurred in the area every month of the year, but are most likely late in spring and in summer.

Relative humidity ranges from about 25 percent in mid-afternoon to 80 percent during the early hours of the day in the warmest and driest months. In winter it ranges from 75 percent in mid-afternoon to around 80 percent or higher early in the morning.

Average snowfall for the area is about 17 inches. There are only 6 to 8 days per year when an inch or more of snow falls. It seldom remains on the ground for more than a few days. Small hail commonly occurs a few times each winter.

During the five month period of November through March, 70 to 80 percent of the sky is covered with clouds on an average day. In July, however, there is only an average of 15 percent cloud cover.

An actual tornado has never been officially recorded in the survey area.

Climatological data for the site area are summarized in TABLE 3-1. Temperature and precipitation data was extracted from the "Soil Survey of Trout Creek-Shaniko Area, Oregon (parts of Jefferson, Wasco, and Crook Counties)" for plateau areas. Jefferson and Crook are adjacent counties to Deschutes. Wind data is from the National Weather Service for Burns, Oregon which is in Harney County.

CLIMATOLOGICAL DATA FOR JEFFERSON COUNTY,OREGON
TABLE 3-1

Month	Temperature		Precipitation	Wind*	
	Average Minimum (°F)	Average Maximum (°F)	Average (Inches)	Average Speed Miles/Hour	Average Direction
January	21	40	1.3	6.2	*.*
February	25	46	1.0	6.3	*.*
March	27	52	0.9	7.6	*.*
April	31	61	0.7	8.7	*.*
May	36	68	1.1	8.6	*.*
June	42	76	1.0	7.9	*.*
July	47	87	0.2	7.7	*.*
August	45	85	0.3	7.1	*.*
September	40	77	0.5	7.0	*.*
October	33	65	1.0	6.4	*.*
November	27	50	1.4	5.4	*.*
December	25	43	1.4	5.8	*.*
Average	33	63	10.8	7.0	*.*

* Based on data from Burns, OR - Harney County

. Prevailing wind direction unavailable

3.3 Geology\Physiography

Camp Abbot is located along the Deschutes River in the Walla Walla Plateau section of the Columbia Plateaus physiographic province. The bedrock in the site area consists almost entirely of basalt lava flows. The lava plateaus are interspersed with many rhyolitic deposits and rhyolite volcanic structures. There are also some deposits of light colored volcanic ash.

The low topographical features are sand dunes, alkali lakes, and shorelines of ice-age lakes. The elevated features are prominently volcanic in origin. Another type of elevated feature are the ash-ring volcano. These structures were formed by more violent eruptions that were assisted by steam. The remaining structure was then cut by wave erosion of the ice-age lakes and left standing as islands in the level lava plateaus.

To the south of the site is an area of extensive faulting. The northwest-southeast trending faults have been softened by erosion and are most visible by air. These faults are collectively named the Brothers fault and of which there are at least twenty five. Everywhere south of the Brothers fault zone the lava plateau is broken into big fault block mountain ranges and valleys; north of it the lava plateau is still relatively intact and unbroken by faulting (Alt and Hyndman 1990).

3.3.1 Soils

Where there are soils present in the site area they are very thin. For the most part, the surface is composed of various outcropping rocks, mostly basalt. In some areas, fault block valley floors filled with muddy sediments that were washed into them from neighboring mountains. These Miocene age fills and sediments are mostly gravelly and silty sand in nature.

3.4 Hydrology

The site area is in the Deschutes River floodplain just downstream of the junction of the Little Deschutes and Deschutes River. The Deschutes Rivers flows north to the Columbia River. There are several reservoirs at the upper end of the Deschutes River basin which appear to control flows. A USGS stream gage is located on the Deschutes River at the downstream limits of the site at Benham Falls (Id. # 14064500). The drainage area at the gage is 1759 square miles with a period of record from 1907 to 1913 and from 1924 to 1991. The zero of the gage is 4142.10 feet NGVD.

3.4.1 Ground Water

The rainfall does not develop connected stream systems. When it does rain, muddy runoff pours off the mountains and into the lowest part of the valleys where the majority of the water ponds and dries, rather than seeping to a ground water reservoir. Towards the western edge of the site, the region is semi-arid. The region provides just enough rainfall to allow lakes to remain full while not allowing any significant drainageways to form (Alt and Hyndman 1990). There is very little engineering information available on the groundwater present in this location.

3.5 Ecology

The information on the endangered and threatened species for this site has been provided by the U.S. Fish and Wildlife Service and the Oregon Department of Fish and Wildlife.

The U.S. Fish and Wildlife Service has indicated that the following Federally protected species may be found in the vicinity of Camp Abbot, Oregon: Columbian white-tailed deer (Odocoileus virginianus leucurus), endangered; white-footed vole (Arborimus albipes), candidate; Pacific western big-eared bat (Plecotus townsendii townsendii), candidate; bald eagle (Haliaeetus leucocephalus), threatened; brown pelican (pelecanus occidentalis), endangered; marbled murrelet (Brachyramphus marmoratus), threatened; Snake River chinook salmon (Oncorhynchus tshawytscha), threatened; Snake River sockeye salmon (Oncorhynchus nerka), endangered; Oregon silverspot butterfly (Speyeria zerene hippolyta), threatened; northern red-legged frog (Rana aurora aurora), candidate; tall bugbane (Cimicifuga elata), candidate; and Howell's montia (Montia howellii), candidate.

The Oregon Department of Fish and Wildlife provided comments on the following State threatened and endangered species: bull trout (Salvelinus confluentus), critical; cascades frog (Rana cascadae), critical; spotted frog (Rana pretiosa), critical; American peregrine falcon (Falco peregrinus), endangered; bald eagle, endangered; northern spotted owl (Strix occidentalis caurina), threatened; black-backed woodpecker (Picoides articus) critical; burrowing owl (Speotyto cunicularia), critical; Ferruginous hawk (Buteo regalis), critical; flammulated owl (Otus flammeolus), critical; Lewis' woodpecker (Asyndesmus lewis), critical; northern goshawk (Accipiter gentilis), critical; pileated woodpecker (Dryocopus pileatus), critical; purple martin (Progne subis), critical; red-necked grebe (Podiceps grisegena), critical; three-toed woodpecker (Picoides tridactylus), critical; white-headed woodpecker (Dendrocopos albolarvatus), critical; yellow-billed cuckoo (Coccyzus americanus), critical; wolverine (Gulo luscus), threatened; American martin (Martes americana), critical; Pacific fisher (Martes pennanti), critical; and Pacific western big-eared bat, critical.

No additional information on the occurrence of rare or endangered species or natural communities is known at this time. This does not mean that other state or federally-listed species may not be present within the areas of interest. An on-site inspection by appropriate state and federal personnel may be necessary to verify the presence, absence or location of listed species, or natural communities if remedial action is recommended as part of the final ASR.

3.6 Demographics of the Area

3.6.1 Center of Activity

Camp Abbot is located near the City of Sunriver, Deschutes County, Oregon. Certain demographic information on Sunriver could not be obtained for this report. Therefore, Sections 3.6.3, 3.6.5, and 3.6.6 will reflect information from the nearby town of Bend, Oregon, which is approximately 15 miles due north of the site. Sunriver has numerous centers of activity such as Two 18 hole golf courses, High desert Museum, Newberry National Monument, Lava Lands Interpretive Center, Sunriver Nature Center, and various parks located throughout the community.

3.6.2 Population Density

City:	Sunriver	County:	Deschutes
Area:	5.3 sq.mi.	Area:	3,025 sq.mi.
POP:	1,600	POP:	74,958
PD:	301.9 persons per sq.mi.	PD:	24.8 persons per sq.mi.

Population and area are based on the U.S. Department of Commerce, Bureau of the Census, 1990 statistics, and telephone interviews.

3.6.3 Business and Industry Profile

A review of both telephone interviews and County Business Patterns (1990) assisted in developing a business profile of the area. The City of Bend is diversified. The largest employers are: St. Charles Medical Center, Bend/LaPine School District, Mt. Bachelor,Inc., Deschutes National Forest. Bend is an economically diverse community. The community supports retail and service industries. There are many small light industries in the area. Small manufacturing is also present.

3.6.4 Type of Housing

Housing in Sunriver is composed of both single and multi-family homes. There are approximately 9,004 housing units with a median value of $68,800.

3.6.5 New Development in the Area

Development in the Bend area include residential dwellings, and increasing small business and manufacturing in the area.

3.6.6 Typical Cross-Section of Population

The ancestry in Bend is diverse. Approximately 57.5% of the population is white, 39% Black, 2.4% Hispanic, 0.9% American Indian or Eskimo, and 0.2% Asian or Pacific Islander. The percent of those under the age of 18 is 24.8%, over 65 years is 13.5%. The median age is 33. The work force, based on the number of establishments, of Deschutes County is broken down into the following: manufacturing, 7.1%; agriculture, 1.7%; trade and finance, 40.3%; services 28.8%; miscellaneous businesses, 20.5%; unclassified, 1.6%.

4.0 Historical Ordnance Usage

4.1 Historical Site Summary

Camp Abbot was established as an Engineer Replacement Training Center (ERTC) in 1943, and the soldiers first arrived for training in March of that year. Up to 10,000 men at a time trained at the camp, and in the 14 months of its operation, 90,000 men proceeded under the famed castle entrance.

The 17 week training cycle at Camp Abbot was divided into three distinct phases. The first phase included training in hand grenades and anti-tank grenades; defense against chemical, air, and mechanized attack; and rifle marksmanship. The next segment provided the troops with demolition training. Nitrostarch and other explosives were used to blast bridges (Abbot Engineer 1944). The last phase of the ERTC program was a three week field maneuver spent under combat zone conditions. (O'Reilly 1989).

Camp Abbot also served as the headquarters for the Oregon Maneuver War Games of 1943, the largest maneuver ever held in the northwest (Abbot Engineer 1943). The engineers took part in the games as a crucial training component for the Allies final push across France and Germany (O'Reilly 1989).

Historical maps show that the camp's facilities included: a tactical training area, a night training area, grenade courts, an anti-aircraft range, field target range, sub-machine gun range, demolition area, ordnance magazines, an anti-tank demonstration area, gas chamber, transition range and a rifle range. On the sub-machine gun range, men crawled under concentration wire with live fire overhead and simulated land mines exploding in the area (Bend Bulletin 1943). On the grenade court, live grenades known as the "G.I. Pineapple" were used by the troops. (Abbot Engineer 1943). On the demolition course, soldiers attacked "enemy" pillboxes.

Gas training was a vital component of the 17 week training cycle. Troops learned how to handle a thermite bomb during a class in incendiary control. Soldiers were instructed how "to combat" the hazardous magnesium bomb along with white phosphorous (Abbot Engineer 1944). A photograph of a pyrotechnic-like explosion in the Base newspaper shows the use of white phosphorous (Abbot Engineer 1944). The paper did not provide a definitive statement saying the chemical was actually used at Camp Abbot. The base newspaper in 1943 stated that a Mustard-Lewisite mixture had been added to the list of chemical agents because it was the standard Japanese blistering agent. Historical research conducted by the St. Louis District yielded no further information on this subject. Copies of pertinent newspaper articles are located at Appendix G.

Camp Abbot ceased operations in June 1944. A letter dated 25 September 1946, states that "A recent inspection of Camp Abbot was made by the chemical officer of the 6th U.S. Army to determine whether poisonous gases were present on the area. This inspection showed that the land was free of any such contamination" (Corps of Engineers 1946). Another letter

dated 30 October 1946 reported, "Camp Abbot has been inspected for decontamination and dedudding and that said camp is hereby declared safe for return to private use" (Corps of Engineers 1946). An additional letter, dated 18 November 1947, states "The lands have been examined and have been cleared of all explosives or explosive objects reasonably possible to detect by visual inspection " (Corps of Engineers 1947).

Today, a portion of the former Camp Abbot is the private resort community of Sunriver. A historical brochure published by Sunriver states that a group of youths found bazooka rockets, bullets, hand grenades and barbed wire that were used in the engineers' bivouac training (O'Reilly 1989). Attempts to pursue this statement have been unsuccessful. According to the INPR, an artillery round and a bazooka round have been found west of the Sunriver Resort and were reported to the Deschutes County Sheriffs Department.

4.2 Review of Historical Records

National Archives and Records Administration
Suitland Branch
4205 Suitland Road
Suitland, MD 20409

All record groups yielded no pertinent information.

Washington National Record Center
4205 Suitland Road
Suitland, MD 20409

RG 77 Records of the Chief of Engineers
Accession A52-259, Box 1, Camp Abbot

RG 338 Records of U.S. Army Commands
Entry: 4th Army, Box 98

National Archives
8th and Pennsylvania
Washington, D.C. 20408

RG 153 Records of the Office of the Judge Advocate General
Entry: Res. Files 1800-1950, Box 358 and 360.

National Archives at College Park
8201 Adelphi Rd
College Park, MD 20740

RG 269 Records of the General Services Administration
Box 8 and 9, Camp Abbot
Maps were procured from the Cartographic Branch.

Center for Military History
1099 14th St. N.W.
Washington, D.C. 20005-3404

Historical and background data was obtained.

Chemical and Biological Defense Agency Historical Office
AMSCB-CIH
Aberdeen Proving Ground
Edgewood, MD 21010

No pertinent information was located at this repository.

National Archives-Pacific Northwest Region
6125 Sand Point Way N.E.
Seattle, WA 98115

RG 103 Records of the Farm Credit Administration
Box 1, File, SP13 WA ORE-3 Abbot

RG 270 Records of the War Assets Administration
Box 58 and 59, Camp Abbot

Federal Record Center-Seattle
6125 Sand Point Way N.E.
Seattle, WA 98115

No pertinent information.

USACOE-Seattle District
4735 E. Marginal Way
Seattle, WA 98124-2255

Historical maps, history of acquisition, ownership data.

National Personnel Record Center-Military Branch
9700 Page Avenue
St. Louis, MO 63132

No pertinent information.

Portland Historical Society
1230 S.W. Park Avenue
Portland, OR 97205

Articles from the Bend Bulletin Newspaper.

Deschutes County Sheriffs
1100 N.W. Bond
Bend, OR 97701

16

Oral reports of previous ordnance discoveries.

Sunriver Nature and Environmental Center
Circle #3
Sunriver, OR 97707

WW II era ordnance that had been kept in storage along with historic photographs and histories.

Director of Public Works
Sunriver Owners Association
P.O. Box 3278
Sunriver, OR 97707

Current maps of the site.

Compliance Inspector
Sunriver Owners Association
P.O. Box 3278
Sunriver, OR 97707

No pertinent data.

Soil Conservation Service
20332 Empire Ave
Suite F1
Bend, OR 97701

No pertinent information.

Department of Fish and Wildlife
61374 Parrell Rd
Bend, OR 97702

No pertinent information.

Department of Environmental Quality
2146 N.E. 4 St
Suite 104
Bend, OR 97701

No pertinent information.

Deschutes National Forest
1645 Hwy 20 East
Bend, OR 97701

No pertinent information.

Deschutes Historical Society
Idaho Street
Bend, OR 97701

Historical information.

Central Oregon Community College
Bend, OR 97701

No information.

CASU Library
St. Louis District Corps of Engineers
St. Louis, MO 63103

Hoegh, Leo and Howard Doyle
1946 *Timberwolf Tracks: The History of the 104th Infantry Division, 1942-45.d* Washington Infantry Journal Press, Washington D.C.

4.3 Summary of Interviews

Interviews were conducted by telephone and in person, both prior to and during the site inspection. The primary purpose of these interviews was to make initial contact with individuals knowledgeable of the site and to coordinate follow-up visits during the site inspection phase of this ASR's preparation. A list of persons interviewed is included at Appendix H. Any pertinent information derived from these discussions is covered within the context of this report.

4.4 Interpretation of Aerial Photography

4.4.1 Photo Analysis

Photographic analysis and land-use interpretation were performed using the following photographic sources:

Photo Date	Approx. Scale	Source	Frame ID#
30 Jul 1951	1"=1,667'	ASCS	35 thru 41 201 thru 207
07 May 1968	1"=1,667'	ASCS	87 thru 93 157 thru 163

The following USGS topographic quadrangles were used as reference for the aerial photography:

Anns Butte, OR (photorevised 1981)
Benham Falls, OR (photorevised 1981)

Photography from 1951 shows many features of military activity at the site. Several ranges between the Deschutes River and the compound are seen. The grenade court area does not indicate evidence of its previous use. The Field Target Range (Anti-Tank) west of the Deschutes River shows a few tracks, but there is abundant vegetation in this area. There do seem to be numerous cleared, straight paths through the wooded areas. In the Anti-Tank Demolition and the Fortification Obstacles areas, there are few trees and some trails can be seen. Tank maneuvers in the area could have possibly caused this.

The cantonment area has many buildings and an extensive road network. Other features observed in the vicinity include the landfill and water treatment plant. A grouping of small unidentifiable rings are visible immediately west of, and adjacent to, the northern end of the camp proper.

Also observed is a cleared area north of the range complex, on the west bank of the river. The remains of four (possibly five) structures are present. The shape and configuration of these structures suggest that this was probably an ordnance storage area. A review of historical installation maps do not show an ordnance area at this location.

1968 photography reveals much of the same as the 1951 photography. New activity is noted. There is a new airstrip on the east side of the Deschutes River that overlays the range complex. The landfill appears to have been expanded eastward. The rings (as stated in previous paragraph) are still visible in this photography.

4.4.2 Map Analysis

Map analysis was performed using the following USGS 7.5' quadrangles:

Anns Buttes, OR (photorevised 1981)
Benham Falls, OR (photorevised 1981)

Planimetric and topographic features are shown on both quadrangles. The planimetric features are varied throughout the quadrangles. There are many roads (hard and loose surface), pipelines, railroad tracks, airfields, golf courses, and buildings. The topographic features are also varied. There is relatively flat land along the Deschutes River. There is also gently rolling hills throughout. There is abundant vegetation and drainage (intermittent) throughout the area. A large lava spill is located just to the northeast of the site.

5.0 Real Estate

5.1 Confirmed DOD Ownership

The FDE indicates that the Army acquired 8,672.45 acres of land by permit from the Department of Agriculture, U.S. Forest Service in October 1942. An additional 984.84 acres of fee land and 29.12 acres of easements were acquired from private parties. The property was originally acquired for use as an Army Engineering Replacement and Training Center. Declared surplus in April 1946, the property, totalling 9686.41 acres, was disposed of through surrender of the use permit and the transfer of the remaining property to the War Assets Administration. Current owners are the Forest Service and Sunriver Properties Oregon, LTD.

None of the real estate documents examined contained ordnance and explosive waste related land use restrictions. Certificates of clearance, indicating that no chemical or ordnance related hazards exist, are included at Appendix E.

5.2 Potential DOD Ownership

No information indicating DOD ownership of any lands other than those mentioned above was uncovered during the archive search.

5.3 Significant Past Ownership

There is nothing in the records to indicate that there were any historically significant past ownerships, other than DOD's, with respect to possible OEW or CWM contamination.

5.4 Present Ownership

The portion of the former site east of the Deschutes River is owned by Sunriver Properties Oregon, LTD. The majority of the lands west of the river are federally owned (National Forest Service). Individual residential tracts are interspersed within the Forest Service and those lands south of Sunriver.

6.0 Site Inspection

The site inspection was conducted on 22-23 May 1995, by the following personnel of the St. Louis District:

Dennis W. Gilmore	Project Manager
Randy Fraser	Safety Specialist
M. Kevin McCaffrey	QASAS
C. John Daly	Historian

All local research was completed in the Fall of 1994, during the conduct of preparing an ASR for the Northwest Maneuver Area (NWMA), DERP-FUDS Site No. F10OR020801. At that time a limited inspection of the site was conducted, focusing specifically on areas of past recoveries. This approach was taken with the knowledge that a more thorough investigation of the site was scheduled. Camp Abbot served as the headquarters for the exercise conducted in the NWMA.

During this initial effort, historical information was obtained from the Sunriver Nature Center including historical photographs and news articles. Most significant was the display of ordnance and related items which had been found on the site. Items observed in the display cabinet included parts of a grenade, a 2.36" bazooka round, and different caliber bullets. Photographs of these items were taken and are included at Appendix I.

The only ordnance related item observed on the site was a grenade spoon, in the vicinity of the grenade courts. The location is defined as Longitude North 43° 58' 52.1", Latitude West 120° 03' 08.0".

During the period 22-23 May 1995, a thorough site visit was conducted. The research indicated that ordnance had been recovered at several locations throughout the former installation as noted in Section 4.1. The location given for these recoveries did not correspond with that of any known or documented range. Our focus was on the thorough examination of these areas and those formally occupied by range facilities.

The presence of several bunkers and targets were identified along with a suspected demolition area. The most potentially significant find was an unvegetated hill side, on which is located a concrete pillbox. At the foot of this hill, southeast of the pillbox were several depressions which may have been used as demolition pits or were very large craters. The pillbox is located at longitude North 43° 54' 46.6" and latitude West 121° 27' 05.4". Historical research did not identify this location as a range. Its discovery lends credence to the fact that ordnance has reportedly been found in the cliffs northwest of the airport, a site which was not identified in historical documents as a range.

The three bunkers, of wood construction with earth cover, were located within the field target range. These structures are approximately eight feet wide, three feet deep, and seven feet high, facing in a westerly direction. It is believed that they provided overhead cover

from artillery for troops assaulting the hill. The middle bunker is located at Longitude North 42° 58' 50.9" and Latitude West 120° 03' 12.6". The two remaining bunkers were approximately 100 yards away.

In addition to the ranges, the ordnance storage area, chemical storage area, and landfill site was investigated. Of these three sites, the only remaining visual evidence is of the ordnance storage area. The foundations of the three structures and berms were identified. (N43° 55' 37.1", W121° 26' 14.7")

East of the ordnance area was what may have been an ordnance disposal pit. The potential pit was horseshoe in shape, bermed and ringed with stone. (N43° 55' 46.5", W121° 26' 14.7")

No evidence of OEW, of a hazardous nature, was found in the course of the site inspection.

7.0 Evaluation of Ordnance Presence

Based on the extensive archive searches performed, the interviews with the owners and/or managers of major portions of this DERP-FUDS site, and previous recoveries of munitions, there exists the possibility of OEW contamination of the site as documented in this ASR.

As noted in Section 4.1 - Historical Site Summary, several items of ordnance have been recovered as recently as the late 1980's. Accurate locations of these recoveries were not provided. These finds indicate that previous actions to clear the site of ordnance were to some degree ineffective, and that additional ordnance may remain. However, based on the limited period of use and the number of troops trained (approximately 100,000), it is assumed that the quantity of remaining ordnance is small, resulting in individual, isolated recoveries.

No indications of CWM contamination were found. However, news articles in the installation's paper mentioned the presence and use, in training, of mustard, incendiaries, and chlorine (Appendix G). Records of the Chemical Warfare Service provided no significant information on the site. Historical documentation did reveal that a Chemical Officer evaluated the possibility of contamination during the site closure process. He found that no contamination existed and issued a clearance certificate (Appendix E).

Based on the review of historical information, the following list of ordnance/chemical munitions were employed:

Small Arms - .30, .45 and .50 caliber.

Artillery - documents only identify "heavy artillery", size unknown and therefore assumed to include 57mm, 75mm, and/or 76mm.

Rockets - documents identify Bazooka rounds; assumed 2.36.

Mortars - 60mm and 81mm.

Grenades - Hand and rifle.

Mines - types unknown.

Demolition materials

Chemical - Mustard, chlorine, white phosphorous (WP), and Smoke.

This site investigation confirmed the presence of ordnance remaining on the site subsequent to use by the DOD.

8.0 Technical Data of Ordnance and Explosives

8.1 Ordnance Related Mission

Though it had a relatively short existence, Camp Abbot's training utilized a multitude of ammunition. The items discovered over the years indicate that high explosive along with practice munitions were used in training. Ordnance include small arms, grenades, shoulder fired rockets, mines, mortars, heavy artillery (size unknown), and demolition materials.

General descriptions of the types of ordnance most likely used at Camp Abbot are located in the following paragraphs, and illustrations and detailed descriptions are provided in Appendix C.

8.2 Description of Ordnance

8.2.1 Small Arms

Small arms refers to those weapons normally accompanying foot troops (infantry). They include rifles, automatic rifles, pistols, and machine guns up to caliber .60 and shotguns. These are: Cal, .50 machine guns, Cal, .30 carbines, rifles, semi-automatic rifles, automatic rifles, and machine guns, Cal, .22 pistols, rifles, and machine guns (for gallery practice), shotguns, 12-gage, Cal, .45 automatic pistols, revolvers, and submachine guns, Subcaliber tubes and adapters for artillery weapons which use ammunition of similar size and type. A complete round of small arms ammunition is known as a cartridge, and is made up of the following components: cartridge case, primer, propelling charge, and bullet. The bullet in general is cylindrical. The nose may be round, as in the cal, .50 bullet, or oval as in all service rifle and machine gun bullets. The base may be square or boat-tailed. Types include the following: Armor-piercing, Ball, Tracer, and Incendiary.

8.2.2 Hand Grenades

Hand grenades are divided into three general types: explosive grenades containing a heavy charge of explosive, chemical grenades which contain a chemical filler, and training. Explosive type grenades include Fragmentation and Offensive. Fuzing is similar in both types which are mechanical action time delays. Fragmentation grenades use either smokeless powder or TNT for filler while the offensive grenade uses flaked TNT. Training grenade, MK IA1 is made of cast iron and is approximately the same shape and size, and weight as a loaded Fragmentation grenade. Chemical grenades include: Smoke, White Phosphorous, Irritants, and vesicant agent.

8.2.3 Rifle Grenades

Rifle grenades fall into three general types: anti-tank grenades, practice anti-tank grenades, and fragmentation grenades. These types are designed to be fired from the cal, .30 rifle and carbine.

8.2.4 Rockets

Rockets are high explosive projectiles launched from a Shoulder Fired Launcher for use against tanks. The rocket consists of three principle parts: the high explosive head, the stabilizer tube, and the fin assembly. The head is a high explosive shape charge. The stabilizer tube contains the fuze and the propellant charge. Two types of rockets are provided; namely, high-explosive and practice.

8.2.5 Anti-tank Mines

An anti-tank mine is an explosive device designed to be laid on the ground or planted flush with the surface for defense against armored cars and tanks. The mines are rather light and their effect is to severely damage or break the tread of a tank. Two types of mines are provided, high-explosive and practice. Mines include M1, M1A1, M4, M5, and their respective practice mines.

8.2.6 Anti-personnel Mines

These mines are designed for effect against personnel and are laid to perform a definite tactical mission. Anti-personnel mine fields are used in anti-tank mine fields to give warning of enemy mine removal as well as for effect against them. Booby traps are installed to operate against personnel. Two standard anti-personnel mines are provided; namely, the Mine, anti-personnel, M2 which in action is similar to a small mortar, projecting the shell about 6 feet into the air where it explodes, and the mine M3, which is a fragmentation type. The complete round of either type consists of the mine, the firing device, and accessories such as trip wires.

8.2.7 Mortars

Motars are classified as semifixed ammunition. Although the ammunition is designed to be loaded into the weapon in one operation, provisions are made for adjusting the propelling charge at the point of fire. The ammunition itself is streamline in design. It has a stabilizer assembly in the rear of the shell to produce stability in flight and to seat the propelling charge. It comes assembled with fuze, propelling charge, and ignition cartridge in place. Two sizes of mortars were standard issue, the 81mm and the 60mm. The general designs are similar. The method of firing is exactly the same. The color, markings, and stenciling for the 60mm are the same as the 81mm mortar of the same type. Types available are High-explosive, Practice, Chemical (81mm only), and Illumination (60 mm only).

8.2.8 Artillery Ammunition

Artillery ammunition is classified according to filler as chemical, inert or explosive. It is also classified according to use, as service, practice, blank or dummy. Service ammunition is used for combat, adjustment, registration and target practice. Depending upon the type of projectile, it may be classified as anti-personnel, high-explosive, high-explosive plastic,

high-explosive antitank, Armor piercing, or Armor piercing capped, and Hypervelocity armor piercing. Practice ammunition is used for training and in most instances, simulates a service round in weight, configuration, and ballistic properties. Practice ammunition may have a inert projectile, or have a small quantity of explosive filler, such as black powder, to serve as a spotting charge. Fuzes are grouped according to assembled position (nose or base) in the projectile and the action of functioning. Action of fuzes include: Time fuze, Combination (time and impact) fuze, and Impact fuzes. Artillery ammunition range in size from 20mm to 16-inch. Color, markings and stencilling for artillery shells, in general, are the same.

8.3 Reference

TM 9-1904, Ammunition Inspection Guide, dtd 2 March 1944

9.0 Evaluation of Other Site Information

No other environmental concerns relevant to DOD were discovered during the research or site visit.

APPENDIX A

REFERENCES

ORDNANCE AND EXPLOSIVE WASTE
CHEMICAL WARFARE MATERIALS
ARCHIVES SEARCH REPORT
FINDINGS
for
CAMP ABBOT
Deschutes County, Oregon

Project No. F10OR004102

APPENDIX A - REFERENCES

A1 INPR REFERENCES

U. S. Army Corps of Engineers
1994 Inventory Project Report: Camp Abbot, Bend, OR. Portland District. (INPR 1994)

A2 HISTORICAL REFERENCES

Abbot Engineer
1943 Pitchin' for Uncle Sam's Team, 2 July:1. Bend Public Library, Bend, OR.

1943 War Maneuvers Slated Near Area of Abbot, 9 July:1. Bend Public Library, Bend, OR.

1944 Fireworks with a Sting, 8 January:3. Bend Public Library, Bend, OR.

1944 Abbot Soldiers Learn how to Blast Bridges, 18 March:1. Bend Public Library, Bend, OR.

Bend Bulletin
1943 Col. Besson Initiates New Course, 1 September:6. Portland Historical Society, Portland, OR.

O'Reilly, Michael
1989 *Camp Abbot: Sunriver's Proud Roots.* Sunriver Nature Center, Sunriver, OR.

U.S. Army Corps of Engineers
1946 Letter from R.W. Love to Property Management Division, Washington, D.C., dated September 25, 1946. Record Group 270, Box 58. National Archives Pacific N.W. Region, Seattle, WA.

1946 Letter from Charles Cohn to the Federal Land Bank of Spokane, Spokane, WA, dated October 30, 1946. Record Group 270, Box 58. National Archives Pacific N.W. Region, Seattle, WA.

1947 Letter from Peter Goerz to the U.S. Forest Service, Washington, D.C., dated November 18, 1947. Real Estate Division, U.S. Army Corps of Engineers, Seattle District.

A3 REFERENCES FOR GEOLOGY AND SOILS

Alt, David D. and Hyndman, Donald W.
1990 *Roadside Geology of Oregon.* Mountain Press Publishing Co., Missoula, Montana.

A4 DEMOGRAPHIC REFERENCES

Bend Chamber of Commerce (503) 382-3221
Sunriver Chamber of Commerce (503)593-8149
U.S. Department of Commerce. Bureau of the Census. Oregon. 1990.

APPENDIX B

GLOSSARY AND ACRONYMS

ORDNANCE AND EXPLOSIVE WASTE
CHEMICAL WARFARE MATERIALS
ARCHIVES SEARCH REPORT
FINDINGS
for
CAMP ABBOT
Deschutes County, Oregon

Project No. F10OR004102

APPENDIX B -- GLOSSARY AND ACRONYMS

AAF	Army Air Field
AA	Anti-Aircraft
AEC	Army Environmental Center
AGO	Adjutant General's Office
AP	Armor Piercing
APDS	Armor Piercing Discarding Sabot
APERS	Antipersonnel
APT	Armor Piercing with Tracer
ASR	Archives Search Report
Aux	Auxiliary
BAR	Browning Automatic Rifle
BD	Base Detonating
BD/DR	Building Demolition/Debris Removal
BE	Base Ejection
BGR	Bombing and Gunnery Range
BLM	Bureau of Land Management
BRAC	Base Realignment And Closure
CADD	Computer-Aided Design/Drafting
Cal	Caliber
CBDA	Chemical and Biological Defense Agency
CBDCOM	Chemical and Biological Defense Command
CE	Corps of Engineers
CEHND	Corps of Engineers, Huntsville Division
CELMS	Corps of Engineers, St. Louis
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERFA	Community Environmental Response Facilitation Act
CFR	Code of Federal Regulations
cfs	Cubic Feet Per Second
COE	Chief of Engineers
COMP	Composition
CTG	Cartridge
CSM	Chemical Surety Material
CSM	Command Sergeant Major
CWM	Chemical Warfare Material
CWS	Chemical Warfare Service
DA	Department of the Army
DARCOM	Development and Readiness Command

DERA	Defense Environmental Restoration Account
DERP	Defense Environmental Restoration Program
DERP-FUDS	Defense Environmental Restoration Program-Formerly Used Defense Sites
DoD	Department of Defense
DOE	Department of Energy
DOI	Department of Interior
EE/CA	Engineering Evaluation/Cost Analysis
EIS	Environmental Impact Statement
EOD	Explosives Ordnance Disposal
EPA	Environmental Protection Agency
ERDA	Environmental Restoration Defense Account
ERTC	Engineer Replacement Training Center
FDE	Findings and Determination of Eligibility
FFMC	Federal Farm Mortgage Corporation
FLCH	Flechette
FS	Feasibility Study
FWS	U. S. Fish and Wildlife Service
FUDS	Formerly Used Defense Sites
GIS	Graphic Information System
GSA	General Services Administration
HE	High Explosive
HEAT	High Explosive Anti-Tank
HEI	High Explosive Incendiary
HEP	Plastic
HE-S	Illuminating
HTRW	Hazardous Toxic and Radioactive Waste
HTW	Hazardous and Toxic Waste
IAS	Initial Assessment Study
INPR	Inventory Project Report
IRP	Installation Restoration Program
MCX	Mandatory Center of Expertise
MG	Machine Gun
MG	Major General
mm	Millimeter
MT	Mechanical Time
MTSQ	Mechanical Time Super Quick
NARA	National Archives and Records Administration
NAS	Naval Air Station
NCDC	National Climatic Data Center
NCP	National Contingency Plan
NFS	National Forest Service
NG	National Guard
NGVD	National Geodetic Vertical Datum
NOAA	National Oceanic and Atmospheric Administration
NOFA	No Further Action
NPRC	National Personnel Records Center
NRC	National Records Center
NWMA	Northwest Maneuver Area
OEW	Ordnance and Explosive Waste
OSHA	Occupational Safety and Health Act
PA	Preliminary Assessment
PD	Point Detonating

PIBD	Point Initiating, Base Detonating
PL	Public Law
QASAS	Quality Assurance Specialist Ammunition Surveillance
RA	Removal Action
RAC	Risk Assessment Code
RD	Remedial Design
RG	Record Group
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasability Study
SARA	Superfund Amendments and Reauthorization Act
SCS	Soil Conservation Service
SLD	St. Louis District, Corps of Engineers
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SWMU	Solid Waste Management Units
TECOM	Test Evaluation Command
TEU	Technical Escort Unit
TNT	Trinitrotoluene
TP	Target Practice
USA	United States of America
USACE	U.S. Army Corps of Engineers
USADACS	U.S. Army Defense Ammunition Center and School
USAED	U.S. Army Engineer District
USAEDH	U.S. Army Engineer Division, Huntsville, AL
USATHMA	U.S. Army, Corps of Engineers, Toxic and Hazardous Materials Agency
USC	United States Code
USDA	U.S. Department of Army
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UXO	Unexploded Ordnance
WAA	War Assets Administration
WD	War Department
WNRC	Washington National Records Center

APPENDIX C

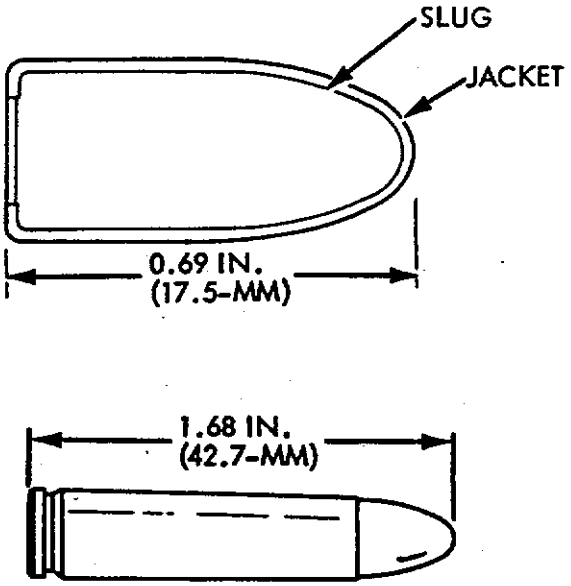
TEXT / MANUALS

ORDNANCE AND EXPLOSIVE WASTE
CHEMICAL WARFARE MATERIALS
ARCHIVES SEARCH REPORT
FINDINGS
for
CAMP ABBOT
Deschutes County, Oregon

Project No. F10OR004102

APPENDIX C - TEXT/MANUALS

CARTRIDGE, CALIBER .30, CARBINE, BALL, M1



Use For Caliber .30, Carbine, M1, M2, or M3.

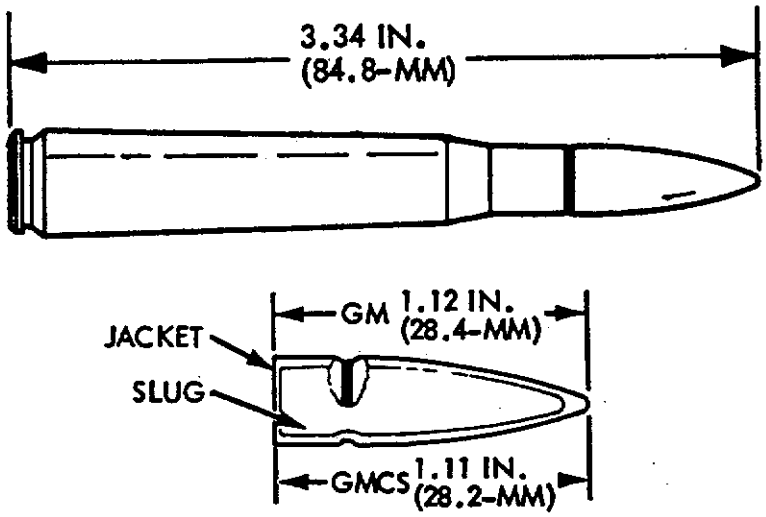
Description: The cartridge is identifiable by the lack of bullet tip color.

Purpose: The cartridge is intended for use against personnel or unarmored targets.

DODAC 1305-A181
Weight ..... 196 grains
Length ..... 1.68 inch
Propellant ..... WC 820
Weight ..... 13 grain

Reference TM 43-0001-27, June 1981

CARTRIDGE, CALIBER .30, BALL, M2



Description: The cartridge is identified by a plain bullet tip.

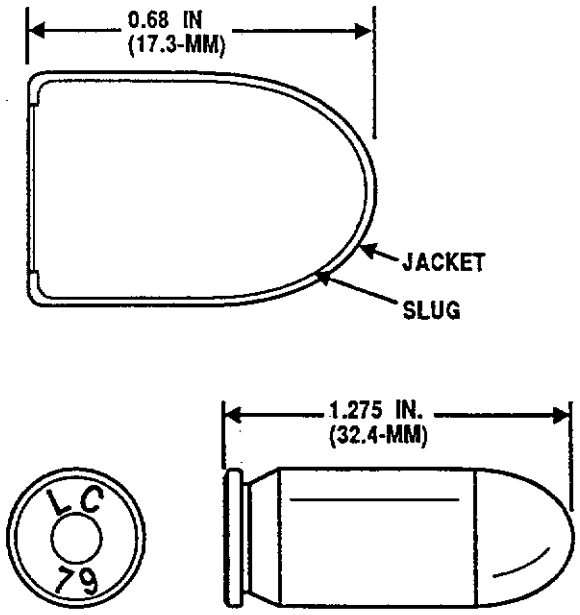
Use: Machine Guns, Caliber .30, M37, M1919A4, M1919A6, and rifle Caliber .30, M1

Purpose: The cartridge is intended for use against personnel or unarmored targets.

DODAC 1305-A212
Weight ..... 416 grains
Length ..... 3.34 inch
Propellant ..... IMR 4895
Weight ..... 50 grain

Reference TM 43-0001-27, June 1981

CARTRIDGE, CALIBER .45, BALL, M1911



Use: Submachine Gun, Caliber .45, M3A1, and Pistol, Caliber .45, M1911A1.

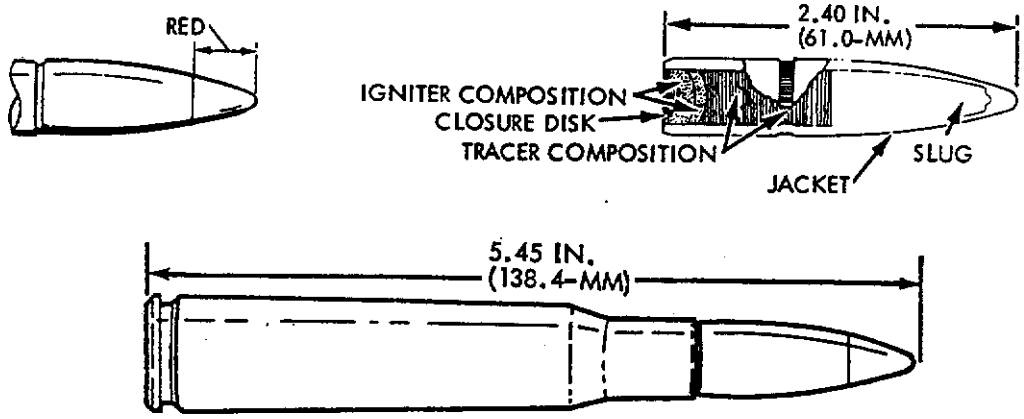
Description: The cartridge is identified by the plain bullet tip.

Purpose: The cartridge is intended for use against personnel.

DODAC 1305-A475
Weight ..... 331 grain
Length ..... 1.275 inch
Propellant ..... SR 7970
Weight ..... 5 grain

Reference TM 43-0001-27, June 1981

CARTRIDGE, CALIBER .50, TRACER, M1



Use: Machine Guns, Caliber .50, M2 and M85.

Description: The cartridge is identified by a red bullet tip.

Purpose: The tracer is intended to permit visible observation of the bullets in-flight path or trajectory to the point of impact.

DODAC 1305-A591
Weight ..... 1785 grain
Length ..... 5.45 inch
Primer ..... Percussion
Propellant ..... IMR 5010
Weight ..... 240 grain

Reference TM 43-0001-27, June 1981

GRENADE, FRAGMENTATION, Mk II, Mk IIA1

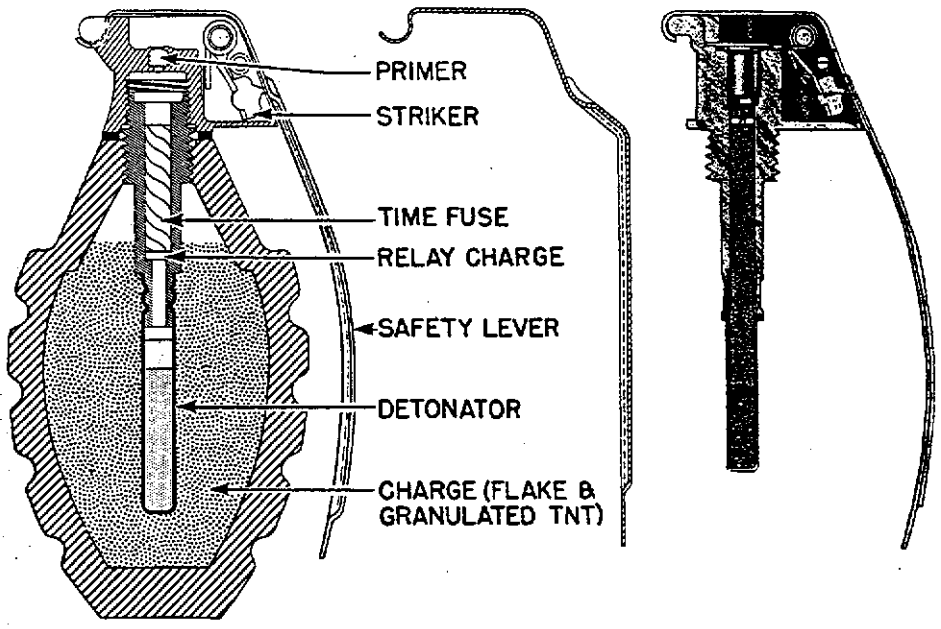


Figure 222. Fragmentation Grenade Mk II with Fuze M204 in place (At right is the Fuze M10A3, issued with an earlier model.)

Description:

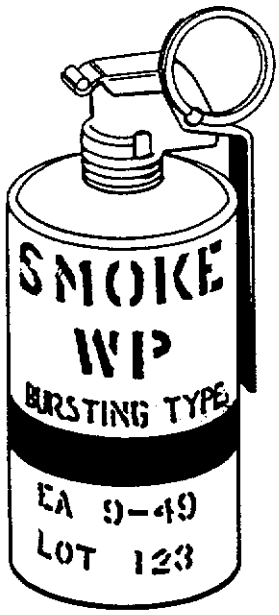
Mk II The grenade has a serrated cast-iron body of the familiar "pineapple" design. The groves run both horizontally and vertically to assist in the formation of uniform fragments of effective size. The grenade is issued with Igniting Fuze M204.

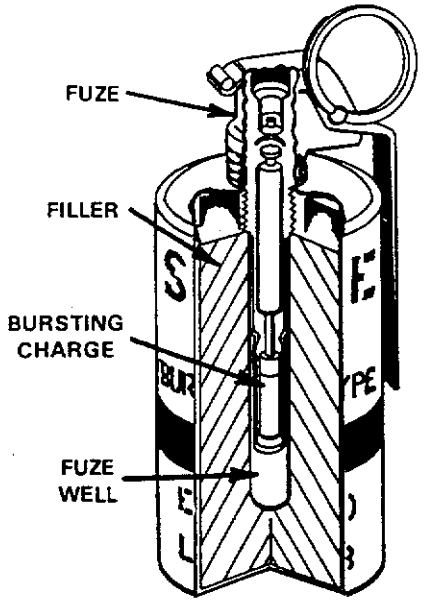
Mk IIA1 Identical to the Mk II except for the Fuze M10A3. The only external difference is that the safety lever fits over rather than under the lip of the fuze body.

DODAC 1330-G890
Length ..... 4.5 inches
Diameter ..... 2.25 inches
Color ..... Olive Drab with or without yellow band
Weight ..... 21 ounces
Filling ..... TNT, Flaked or granular
Weight of filling ..... 2 ounces
Fuze M204A1, M204A2

Reference ..... TM 43-0001-29, Oct 77
OP 1664 w/change 1, Feb 54

GRENADE, SMOKE, WP, M15





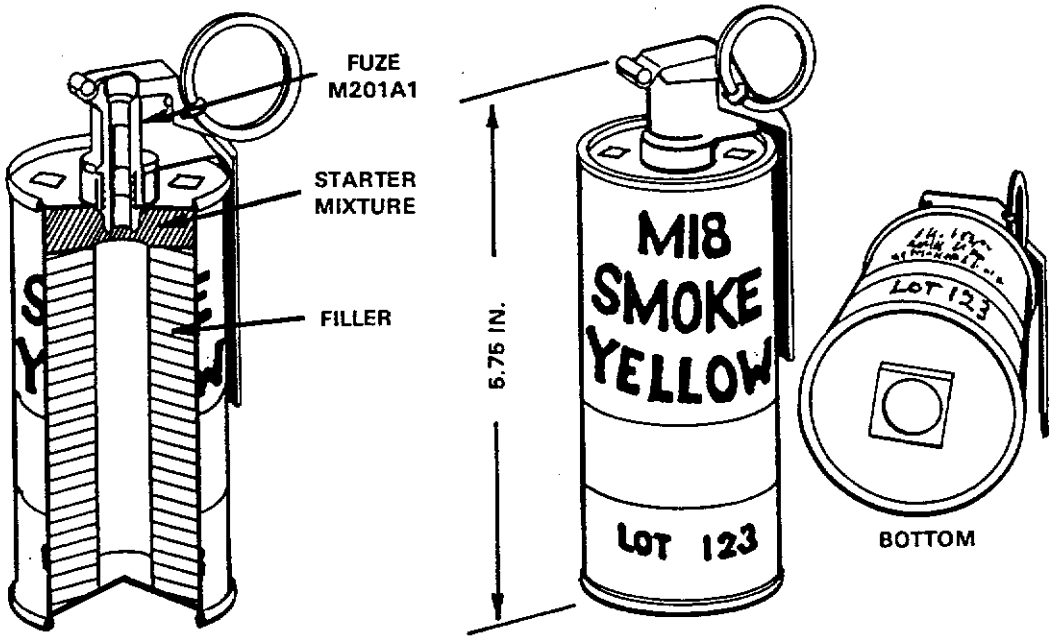
Description: The WP smoke hand grenade M15 is a bursting type grenade used for signaling, screening and incendiary purposes. The grenade body is of sheet steel and is cylindrical in shape. The body has a fuze well liner and is filled with White Phosphorous.

The Fuze M206A1 and M206A2 are pyrotechnic delay-detonating fuzes.

DODAC 1330-G935
Length ..... 4.5 inches
Diameter ..... 2.38 inches
Color ..... Grey w/1 yellow band and yellow markings
Weight ..... 31 ounces
Filler ..... White Phosphorous (WP)
Weight of filler ..... 15 ounces
Fuze M206A1, M206A2

Reference TM 43-0001-29 w/change 11, Oct 77

GRENADE, SMOKE, M18 with FUZE M201, M201A1



Description:

These grenades may be filled with any one of seven smoke colors; red, orange, blue, green, black, violet, and yellow. The grenade body is of thin sheet metal and filled with a smoke composition. Emission ports are covered with small squares of adhesive tape and vary in quantity and location depending on the year of manufacturing.

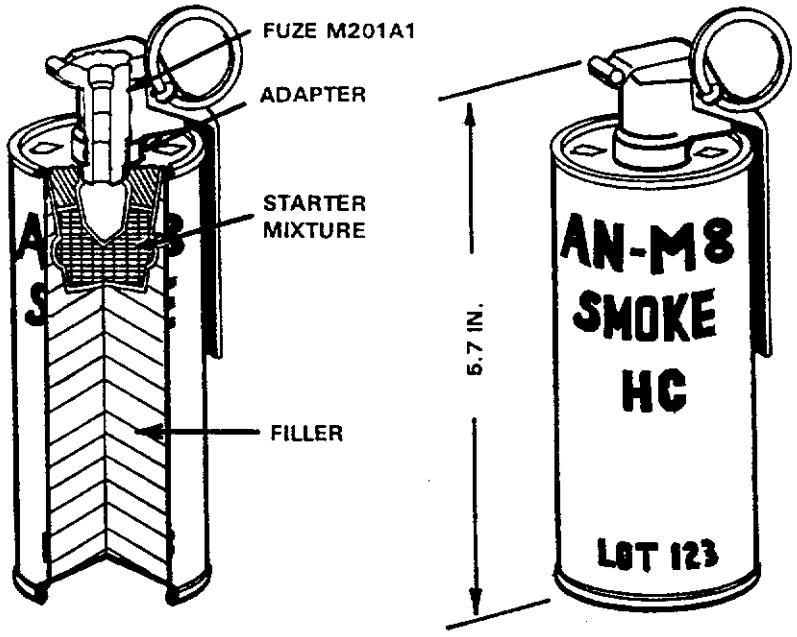
The Fuze M201 and M201A1 is a pyrotechnic delay-igniting fuze. The body contains a primer, first fire mixture, pyrotechnic delay column, and ignition mixture

Length	5.75 inches
Diameter	2.5 inches
Color	Blue grey or light green w/black markings
Weight	19 ounces
Filler	Smoke composition
Weight of filler	11.5 ounces
Fuze	M201A1

Reference

TM 43-0001-29 w/change 11, Oct 77
OP 1664 w/change 1, Feb 54

GRENADE, SMOKE, HC, AN-M8



Description:

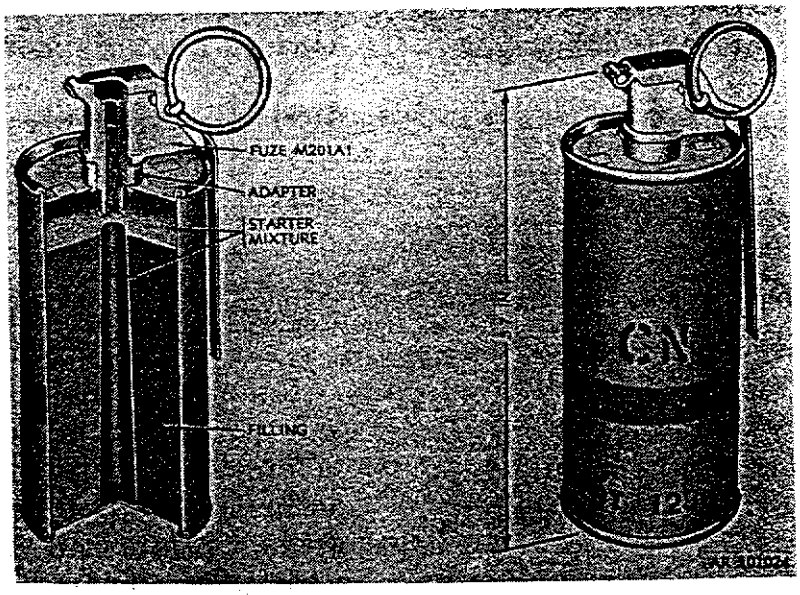
The grenade body is a cylinder of thin sheet metal. It is filled with HC smoke mixture with a starter mixture directly under the fuze opening. The duration of the smoke screen or signal is 105 to 150 seconds.

The Fuze M201 and M201A1 is a pyrotechnic delay-igniting fuze. The body contains a primer, first fire mixture, pyrotechnic delay column, and ignition mixture

DODAC 1330-G930
Length . . . . . 5.7 inches
Diameter . . . . . 2.5 inches
Color . . . . . Blue grey or light green w/black markings
Weight . . . . . 24 ounces
Filler . . . . . Hexachlorethane-zinc (HC)
Weight of filler . . . . . 19 ounces

Reference TM 43-0001-29 w/change 11, Oct 77
OP 1664 w/change 1, Feb 54

GRENADE, HAND, TEAR, CN, M7 and M7A1



Description:

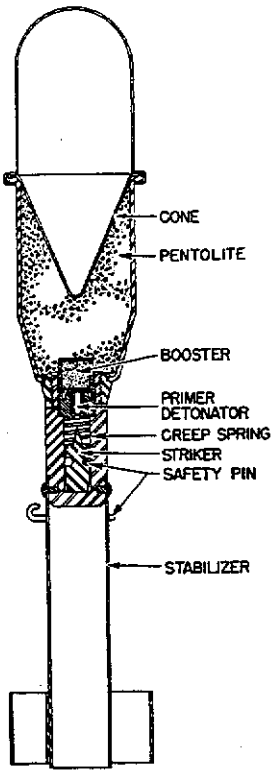
M7A1 grenade is a cylindrical thin sheet metal container with four emission holes in the top and one in the bottom. The filler is a mixture of CN, sugar, potassium chlorate, potassium bicarbonate, and a finely divided inert substance (diatomaceous earth). The emission holes are covered with adhesive tape to protect the filling from moisture. filled with CN. The Fuze M201A1 is a pyrotechnic-igniting fuze.

M7 grenade is similar to the M7A1 grenade, except that the M7 grenade has 18 emission holes in the sides and none in the bottom. It also contains less filler and produces about half as much effective CN gas as the M7A1. The grenade operates and functions in the same manner as the M7A1.

DODAC 1330-G960
Length ..... 5.7 inches
Diameter ..... 2.5 inches
Color ..... Blue grey or grey w/1 red band and red markings
Weight ..... (M7) 17 ounces, (M7A1) 18.5 ounces
Filler ..... CN- Pyrotechnic composition
Weight of filler ..... (M7) 10.25 ounces, (M7A1) 12.5 ounces
Fuze M201A1

Reference TM 43-0001-29 w/change 11, Oct 77
TM 3-300, Aug 56

ANTI-TANK RIFLE GRENADE M9A1

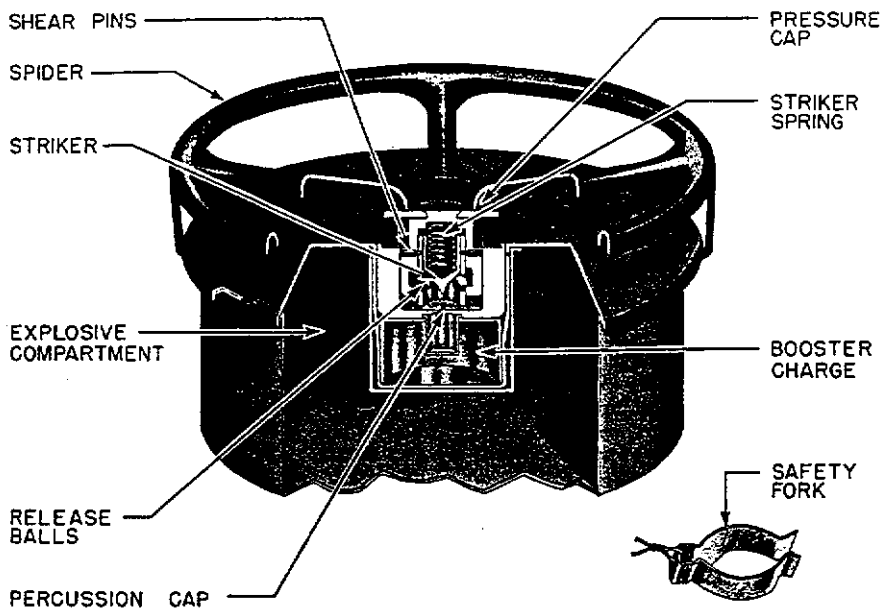


Description: Anti-Tank Grenade M9A1 consists of a body, a stabilizer assembly, and a fin. The body is cylindrical, the two pieces joined in the middle with rounded ends. The stabilizer is a hollow tube which screws into the base of the body and fits over the launcher. The body is made of cast metal. The impact fuze, which consists of a striker held away from the detonator by a creep spring and a safety pin, is assembled integrately with the stabilizer assembly. The safety pin projects through the fuze body and clamps around the stabilizer tube. When the pin is withdrawn, a drop of two feet, nose first, to a hard surface will cause the fuze to function.

Length ..... 11.24 inches
Diameter ..... 2.25 inches
Color ..... Olive drab
Weight ..... 1.23 pounds
Filler ..... Pentolite
Weight of filler ..... 4 ounces

Reference OP 1664, Feb 54

MINE, ANTI-TANK, M1A1

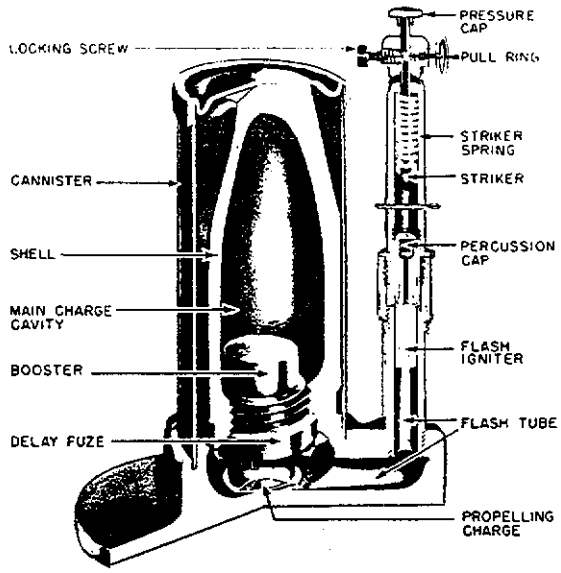


Description: The metallic Anti-Tank Mine, M1A1 has three main components: loaded body, fuze, and spider. The spider fits over the fuze to increase the effective size of its head. The steel body is a squat cylindrical container of light steel filled with high explosive. A carrying ring is attached to its side. In the center of the top is the cavity for the fuze and booster: the booster fits into the cavity and locks into place. The fuze, M1A1 consists of a striker assembly and a body with a primer. Pressure of 500 pounds directly on the fuze head, or 250 pounds on the edge of the spider functions the mine. The fuze, M1A2 is identical in outward appearance to the M1A1. The detonator is more powerful to insure a high-order explosion. The safety fork is removed to arm the mine and is left beside the mine attached to the mine with a cord.

Practice mine M1B1 is made of sheet metal and resembles the service mine except that the filling hole is in the bottom of the mine body. The mine is sand-filled to weight before is issued for use in practice. Four sections are cut out of the top of the bomb body near the fuze well to permit the passage of smoke. The mine is painted blue with white markings.

Diameter	8 inches
Height (with spider)	4 inches
Height of body	2.75 inches
Total Weight	10.6 pounds
Filler	TNT (cast)
Weight of Filler	6 pounds
Colors	The bottom and ¾ inch if the side are painted yellow; the rest of the mine is painted olive drab
Fuze	M1A1, M1A2
Reference	OP 1664, U.S. Explosive Ordnance, May 47

MINE, ANTI-PERSONNEL, M2

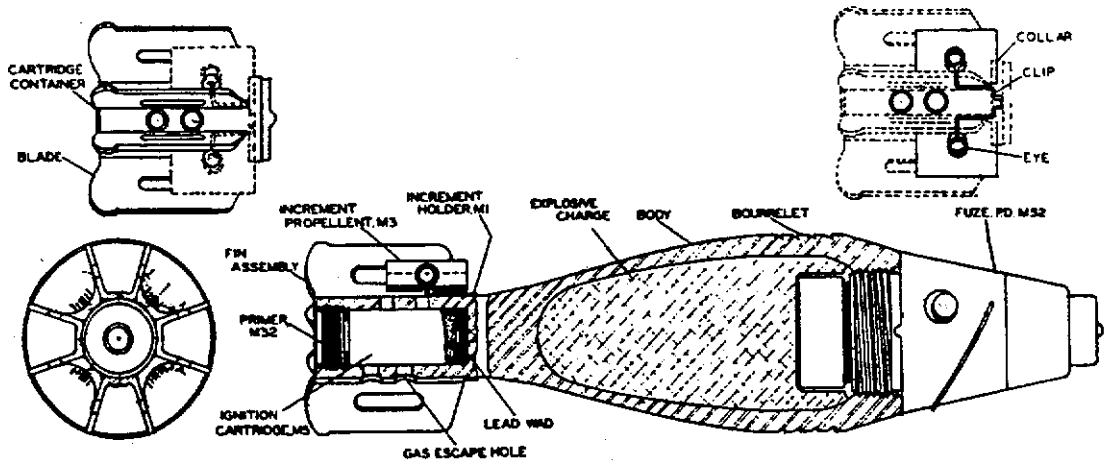


Description: the M2 is a "bounding" anti-personnel mine, usually activated by a combination firing device. The mine consists of an explosive shell contained in an upright thin-walled steel tube which is riveted to the base plate. A cavity in the base plate contains the propelling charge, which consists of 20 grains of black powder. The tube containing the shell is sealed at the top by a metal cap. The mine is similar to a small mortar. When the fuze is actuated, the primer sets off the igniter. The flash from the igniter sets off the propelling charge in the base plate which projects the shell into the air and at the same time ignites the delay fuze in the base of the shell. When the shell is at a height of approximately six feet above the base plate, the delay fuse fires a tetryl booster, which detonates the main charge. These mines are usually fuzed with the Combination Fuze M2 or M2A1 consisting of the combination firing device M1 with an igniter cap attached, or with the combination Fuze M6.

Over-all Height ..... 6.5 inches
Case diameter ..... 2.5 inches
Base diameter ..... 5.25 inches
Weight of shell ..... 3 pounds
Filler Weight ..... 0.4 pounds
Colors ..... Mine and firing device is dull olive drab in color except for the base flange which is yellow.
Fuze ..... M2, M2A1, or M6

Reference OP 1664, U.S. Explosive Ordnance, May 47

MORTAR, 60-MM, H.E., M49A2



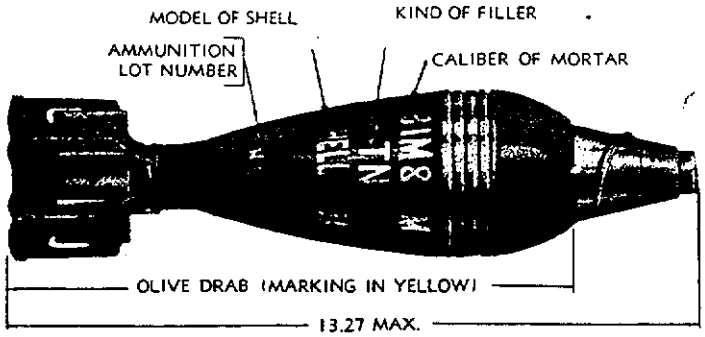
Description: The body of this shell may be constructed of forged steel, cupped-rolled, plate-welded lonitudinally, or a machined casting. It is tear-dropped in shape, having a blunt nose and tapered tail. Near the nose end of the shell is a machined bourrelet which acts as a forward bearing surface and as a gas check. The nose is threaded to receive the fuze directly. The fuze used is the Point-detonating Fuze M52 which has a superquick action. The tail end is closed and internally threaded to receive the stabilizer assembly. The shell filler is 0.34 pounds of flake TNT. The ignition cartridge M5A1, contains 40 grains of double base powder. The propellent increments, M3, consists of square strips of double base powder sewn together. Each increment has 35 grains of finely granulated double base powder. The shell body is painted olive drab and stencilled in yellow.

Shell, Practice, M50A2 is identical to the service round. It differs in that the filler consists of 0.05 pounds of black powder to act as a spotting charge, and 0.29 pounds of inert filler. The body is painted blue with white stencilling.

Over-all Length . . . . . 9.5 inches
Diameter (body) . . . . . 60 mm
Total Weight . . . . . 2.94 pounds
Filler . . . . . TNT (flaked)
Filler weight . . . . . 0.34 pounds
Propellent . . . . . ballistite
Fuze M52
Painting and markings . . . . . Olive drab w/ yellow markings

Reference . . . . . TM 9-1904, Ammunition Inspection Guide, Mar 44

MORTAR, 81-MM, H.E. & PRACTICE, M43A1



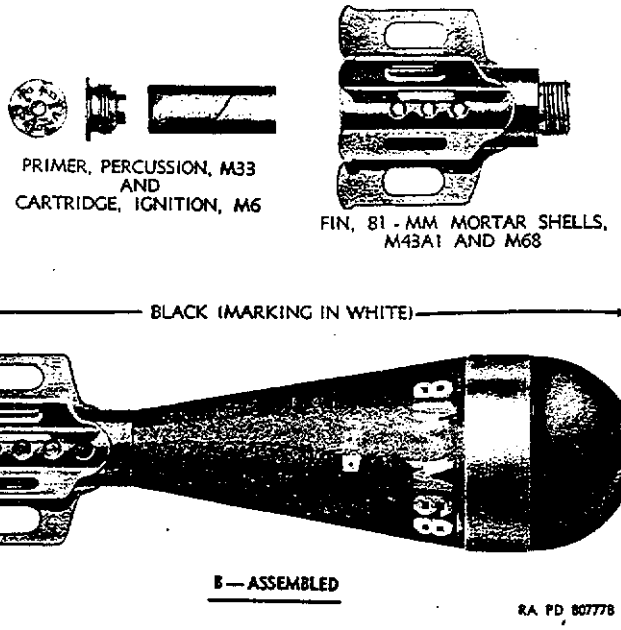
Description: The body of this shell is constructed of forged steel and is tear-dropped shape. It has a bourrelet machined near the nose of the shell consisting of several annular grooves which serves to act as a forward bearing surface and a gas check. The nose is machined and threaded to receive an adapter. The adapter is threaded and acts as a bushing for a bakelite fuze well cup and the fuze. The fuze used is the Point-detonating Fuze M52 which has a superquick action. The filler is 1.22 pounds of TNT. The fin assembly consists of a machined cartridge container to which are attached six stationary fins. The ignition cartridge M6, red, is similar in appearance to a shotgun shell; and contains 120 grains of double base powder. The propellent increments, M1, consists of square strips of double base powder sewn together. Each increment has 117 grains of finely granulated double base powder. The shell body is painted olive drab and stencilled in yellow.

Shell, Practice, M43A1 is identical to the service round. It differs in that the filler consists of 0.16 pounds of black powder to act as a spotting charge, and 1.06 pounds of inert filler. The body is painted blue with white stencilling.

Over-all Length ..... 13.2 inches
Diameter (body) ..... 81 mm
Total Weight ..... 7.05 pounds
Filler ..... TNT
Filler weight ..... 1.22 pounds
Propellent ..... ballistite
Fuze M52
Painting and markings ..... Olive drab w/ yellow markings

Reference ..... TM 9-1904, Ammunition Inspection Guide, Mar 44

MORTAR, 81-MM, TRAINING, M68



Use: The shell is designed to give the mortar crew training in loading and practice in firing under conditions which will not permit firing in more than the first zone..

Description:

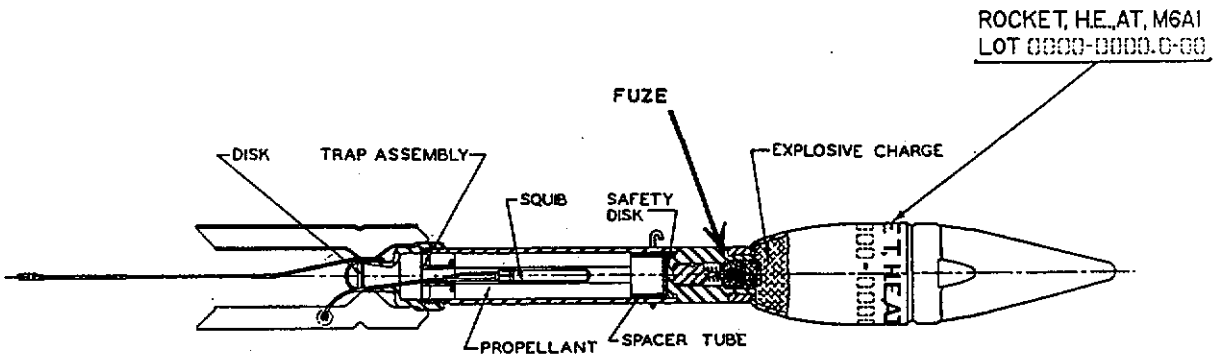
Shell body. The body of the shell is cast iron. It is similar in shape to the light H.E. 81-mm shell which is tear-drop with a blunt nose and tapered tail. It has a bourrelet on the body near the nose to act as a gas check. At the tail end is a recess which is threaded to receive a stabilizer assembly. The nose is closed and rounded with no provisions made to receive a fuze. Its weight varies depending on its weight zone. Nine weight zones are used with a minimum of 9.50 pounds and a maximum of 10.10 pounds, weighed without fin assembly and ignition cartridge.

The fin assembly and propelling charge. The fin assembly consists of six stationary fins. It receives the Ignition Cartridge M3. Several ignition cartridges are provided with each round so the shell can be fired more than one time. The are no propellent increments used because the shell is designed to be fired in the first zone only. The maximum range is 350 yards.

Marking. The shell is painted black with white stencil. On the shell body may be found a number of white squares (one to nine) with a prick punch mark in the center of each to indicate the zone weight

Reference ..... TM 9-1904, Ammunition Inspection Guide, Mar 44

ROCKET, 2.36-INCH ANTITANK, M6A1 & PRACTICE, M7



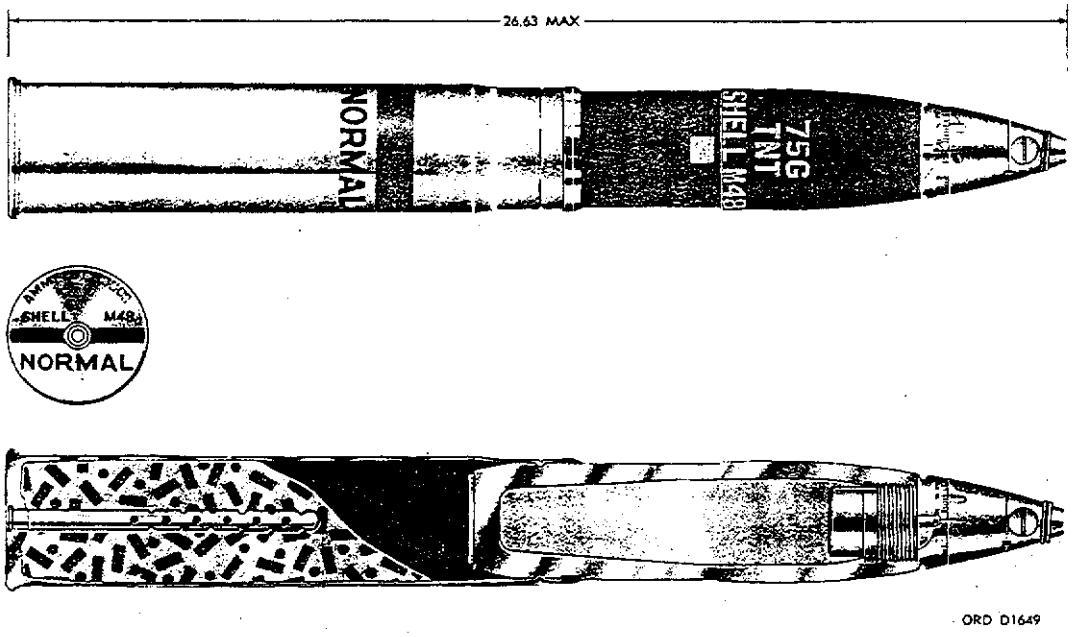
Use: Pill boxes, tanks, and armored vehicles are prime targets. The rocket can also be used in a stationary emplacement for demolition or as an anti-tank mine or booby trap.

Description: The Rocket is 21½ inches long and weighs 3½ pounds. The rocket consists of thehigh-explosive head, the stabilizer tube and the fin assembly. The head contains a shape-charge containing a composition which is mainly 50/50 pentolite with a 10/90 pentolite booster surround. The stabilizer tube consists of the fuze body which contains the fuze mechanism, and the powder tube contains the propellent charge. The fuze consists of a steel firing pin which slips into the central cavity of the fuze body, where it is held in a rearward position by the firing-pin spring. When the safety pin is removed, the firing pin will overcome the spring and detonate the rocket if dropped over four feet. The fin assembly consists of the nozzle, the trap and six metal fins. The rocket is painted lustreless olive drab and stenciled in yellow.

Practice Rocket, M7A1 is similar to the service round in shape, size, and weight. However, it is provided with only a propellent charge, the head is inert and no fuze is provided. The end of the stabilizer tube is extended to counter-weight the head and make ballistics similar. A safety pin passes through the stabilizer to simulate realism during training. The rocket is painted black and stenciled in white.

Over-all Length	21.6 inches
Diameter (body)	2.23 inches
Total Weight	3.5 pounds
Filler	Pentolite
Propellent	ballistite
Fuze	M400
Painting and markings	M6A1- olive drab w/ yellow markings M7A1- black w/ white markings
Reference	TM 9-1904, Ammunition Inspection Guide, Mar 44

SHELL, 75-MM, HIGH EXPLOSIVE, M48



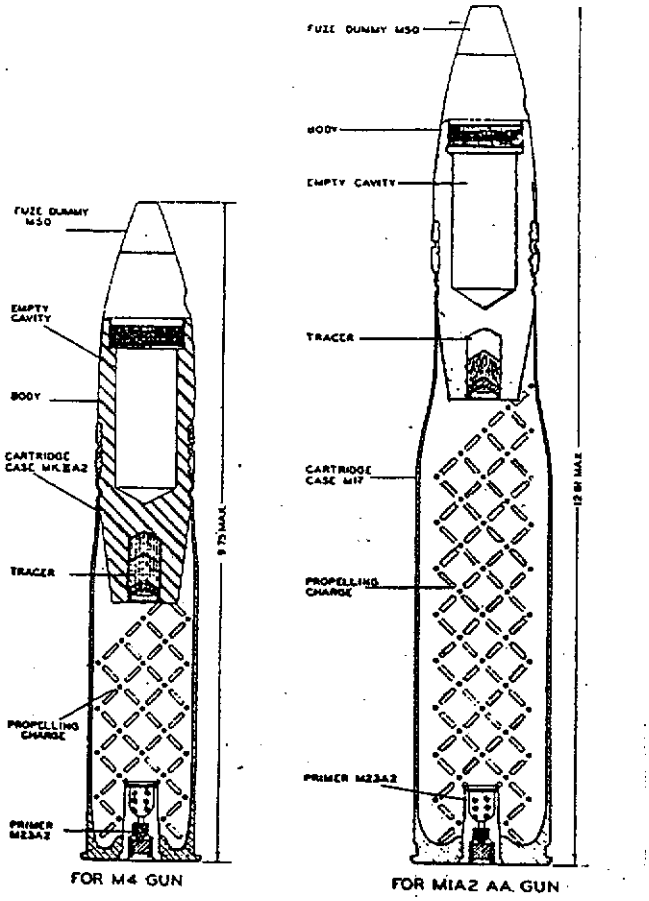
Use: There are four types of 75-mm guns. The Field Guns, M1897-16-17, Tank Guns M2, M3, T7, Antiaircraft Gun T6, and the Aircraft Gun M4. The complete round as issued may be used against personnel, for demolition of above-ground targets, for penetration effects against heavier targets, and in barrages.

Description: This projectile is streamlined with a tapered or boat-tailed base. The projectile is made of forged steel; it has a rotating band of gilding metal, a fringing groove and a steel base cover spot welded to its base. The booster and fuze assemble directly to the nose of the shell, the booster being tightened in place by a set screw. The standard bursting charge consists of 1.49 pounds of TNT. The round is issued fuzed. The propelling charge M18 and M18B1 provides three charges; normal, super, and reduced. The projectile is painted lusterless olive drab and is stenciled in yellow.

Over-all Length (Max)	26.6 inches
Diameter (body)	75 mm
Total Weight	14.70 pounds
Filler	TNT
Filler weight	1.49 pounds
Cartridge Case	M18, M18B1
Propellent	FNH powder
Fuze	M48A2, M54, M51A4, M21A4
Painting and markings	Olive drab w/ yellow markings

Reference ..... TM 9-1904, Ammunition Inspection Guide, Mar 44

PROJECTILE, 37 mm PRACTICE w/TRACER, M55A1



Use: M4 Gun and M1A2 AA Gun

Description: The Projectile M55A1 is made up of three parts. The body has no filler, but is made to the same size and weight as the high explosive M54. A tracer cavity is machined into the base. The tracer consists of red tracer composition and igniting compound closed into the tracer cavity. The fuze, dummy, M50, is entirely inert and is made in one piece aluminum. It is of the same size, shape, and weight as the M56 Fuze. Aside from the blue painting and white stenciling on the projectile, it may be distinguished as the Practice Round M55A1 by the Dummy Fuze M50. Over-all length depends on the cartridge case used.

Length (projectile)	5.9 inches
Over-all length w/cartridge case	9.75 or 12.81 inches
Diameter	37 mm
Weight	1.34 pounds
Filler	None
Fuze	M50 Dummy Fuze
Reference	TM 9-1904

APPENDIX D

REPORTS / STUDIES

ORDNANCE AND EXPLOSIVE WASTE
CHEMICAL WARFARE MATERIALS
ARCHIVES SEARCH REPORT
FINDINGS
for
CAMP ABBOT
Deschutes County, Oregon

Project No. F10OR004102

APPENDIX D -- REPORTS/STUDIES

D-1 U. S. Army Corps of Engineers - Portland District
Inventory Project Report (INPR) for Camp Abbot, Oregon.
13 October 1993, Revised 6 April 1994.

CENPD-PM-MP (CEMP-RF/31 May 94) (200-1a) 1st End
Mr. Han/ds/(503) 326-7361
SUBJECT: Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS) Inventory Project Report (INPR) Camp Abbott, Oregon, Site No. F10OR004100, Project Nos. F10OR004101 (BD/DR) and F10OR004102 (OEW)

CDR, North Pacific Division, Corps of Engineers, P.O. Box 2870, Portland, Oregon 97208-2870 30 June 1994

FOR Commander, Portland District (CENPP-PM)

1. The CEMP-RF approval for the subject project is forwarded for your action.

2. Request that you, as a Project Manager for this site:

a. Coordinate with CEHND for all matters related to OEW project

b. Provide a copy of project fact sheets for the site prior to initiation of any actions and quarterly thereafter.

c. Notify the landowners of the approval within 60 days of this memorandum and furnish copies of the notification letters to CEMP-RF, CEHND-PM, and this office.

d. Update the DERP-FUDS database.

3. The CENPD-PM-MP POC for this action is Mr. Moon Han, (503) 326-7361.

FOR THE COMMANDER:

JOHN E. VELEHRADSKY, P.E.
Director of Programs and
Project Management

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

CEMP-RF (200-1a)

31 MAY 1994

MEMORANDUM FOR

COMMANDER, NORTH PACIFIC DIVISION, ATTN: CENPD-PM
COMMANDER, HUNTSVILLE DIVISION, ATTN: CEHND-PM

SUBJECT: Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS) Inventory Project Report (INPR) - Camp Abbott, Oregon, Site No. F10OR004100, Project Nos. F10OR004101 (BD/DR) and F10OR004102 (OEW)

1. Reference:

a. Engineer Regulation, ER 5-7-1(FR), 30 Sep 92, Subject: Project Management.

b. Memorandum, CEMP-RF, 16 Nov 92, Subject: Implementation of Project Management for the Defense Environmental Restoration Program for Formerly Used Defense Sites(DERP-FUDS).

c. Memorandum, CENPD-PM-MP, 10 Feb 94, SAB.

d. Memorandum, CEMP-RF, 08 Mar 94, SAB

e. Memorandum, CEHND-PM-SO, 12 May 94, Subject: DERP-FUDS INPRs Requiring an Ordnance and Explosive Waste (OEW) Engineering Evaluation/Cost Analysis (EE/CA).

2. This memorandum authorizes an OEW project (Project No. F10OR004102) described in the INPR for the subject site. The first phase of this project will be a phased EE/CA study as recommended in Ref 1.e. The subject Building Demolition and Debris Removal (BD/DR) project (F10OR004101) was not approved previously per Ref 1.d.

3. CENPD will assign the Project Manager (PM) for this site IAW Ref 1.a & 1.b. This memorandum assigns Technical Management responsibility for execution of the subject OEW project through Removal Design to CEHND. The assigned Technical Manager (TM) will provide technical support for all phases of the subject project. If required, CENPP will execute Removal Action.

4. Request that CENPD, CEHND, and CENPP ensure that the subject project number appears on all OEW project specific documentation.

CEMP-RF
SUBJECT: Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS) Inventory Project Report (INPR) - Camp Abbott, Oregon, Site No. F10OR004100, Project Nos. F10OR004101 (BD/DR) and F10OR004102 (OEW)

5. We request:

a. The PM, within sixty days of the date of this memorandum, notify the landowners of the decision and provide copies of the notification letter to CEMP-RF and CEHND-PM-OT.

b. The proposed OEW projects should be included in the DERP-FUDS workplans and database. All contracts should be awarded before the end of the third quarter of any fiscal year.

c. CENPD ensure that the PM updates the DERP-FUDS database within thirty days of the date of this memorandum. CEHND will periodically screen the database to ensure that the geographical districts have provided the required update.

6. The POC at this HQ is Mr. Mohinder Saini, (202) 272-1594.

FOR THE DIRECTOR OF MILITARY PROGRAMS:

Patricia A Lin OTC, Deputy
for CARY JONES
Chief, Environmental Restoration
Division
Directorate of Military Programs

CF:
CENPD-PM-MP (Han)
CEHND-PM-ED (Britton)
CENPP-PE-DC (Gross)

PE-DC

DEPARTMENT OF THE ARMY
NORTH PACIFIC DIVISION, CORPS OF ENGINEERS
P.O. BOX 2870
PORTLAND, OREGON 97208-2870

Reply to
Attention of:

CENPD-PM-MP (200-1a)

01 OCT 1993

MEMORANDUM FOR CDR, USAED, HUNTSVILLE DIVISION (CEHND-PM-E),
P.O. BOX 1600, HUNTSVILLE, AL 35807-4301

SUBJECT: Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS); Inventory Project Report (INPR), for Site No. F10OR017000, Central Oregon Air to Air Gunnery Range Military Reservation, Oregon

1. I am forwarding the subject INPR for your review. Although initial Risk Assessment Code is determined to be 5 (No Further Action), the Portland District wants further review by the Mandatory Center of Expertise (MCX) for Ordnance and Explosive Waste (OEW) due to the nature of past activities. The site is determined to be a formerly-used defense site.

2. I recommend that CEHND:

a. Determine the need for further study and take necessary actions.

b. File this INPR.

3. The CENPD-PM-MP POC for this action is Mr. Moon-Yong Han, P.E., (503) 326-7361.

ERNEST J. HARRELL
Major General, USA
Commanding

Encl
Memo, CENPP-PE-DC
8 Sep 93

CF (w/encl):
CEMP-RF (w/encl)
CENPP-PM-M (w/o encl)
CENPP-PE-DC (w/o encl)

CENPD-PM-MP (CEMP-RF/2 Jun 94) (200-1a) 1st End
Mr. Han/ds/(503) 326-7361
SUBJECT: Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS) Inventory Project Report (INPR) Central Oregon Air to Air Gunnery Range Military Reservation, Oregon, Site No. F10OR017000, Project No. F10OR017001 (OEW)

CDR, North Pacific Division, Corps of Engineers, P.O. Box 2870, Portland, Oregon 97208-2870 30 June 1994

FOR Commander, Portland District (CENPP-PM)

1. The CEMP-RF approval for the subject project is forwarded for your action.

2. Request that you, as a Project Manager for this site:

a. Coordinate with CEHND for all matters related to OEW project

b. Provide a copy of project fact sheets for the site prior to initiation of any actions and quarterly thereafter.

c. Notify the landowners of the approval within 60 days of this memorandum and furnish copies of the notification letters to CEMP-RF, CEHND-PM, and this office.

d. Update the DERP-FUDS database.

3. The CENPD-PM-MP POC for this action is Mr. Moon Han, (503) 326-7361.

FOR THE COMMANDER:

JOHN E. VELEHRADSKY, P.E.
Director of Programs and
Project Management

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

nd

0 2 JUN 1994

REPLY TO
ATTENTION OF:
CEMP-RF (200-1a)

MEMORANDUM FOR

COMMANDER, NORTH PACIFIC DIVISION, ATTN: CENPD-PM
COMMANDER, HUNTSVILLE DIVISION, ATTN: CEHND-PM

SUBJECT: Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS) Inventory Project Report (INPR) - Central Oregon Air to Air Gunnery Range Military Reservation, Oregon, Site No. F10OR017000, Project No. F10OR017001 (OEW).

1. Reference:

a. Engineer Regulation, ER 5-7-1(FR), 30 Sep 92, Subject: Project Management.

b. Memorandum, CEMP-RF, 16 Nov 92, Subject: Implementation of Project Management for the Defense Environmental Restoration Program for Formerly Used Defense Sites(DERP-FUDS).

c. Memorandum, CENPD-PM-MP, 01 Oct 93, SAB.

d. Memorandum, CEHND-ED-SY, 09 Dec 93, Subject: DERP-FUDS INPRs Requiring an Ordnance and Explosive Waste (OEW) Engineering Evaluation/Cost Analysis (EE/CA)

2. This memorandum authorizes an OEW project (Project No. F10OR017001) described in the INPR for the subject site. The first phase of this project will be a phased EE\CA study as recommended in Ref 1.d.

3. CENPD will assign the Project Manager (PM) for this site IAW Ref 1.a & 1.b. This memorandum assigns Technical Management responsibility for execution of the subject OEW project through Removal Design to CEHND. The assigned Technical Manager (TM) will provide technical support for all phases of the subject project. If required, CENPP will execute Removal Action.

4. Request that CENPD, CEHND, and CENPP ensure that the subject project number appears on all OEW project specific documentation.

CEMP-RF
SUBJECT: Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS) Inventory Project Report (INPR) - Central Oregon Air to Air Gunnery Range Military Reservation, Oregon, Site No. F10OR017000, Project No. F10OR017001 (OEW).

5. We request:

a. The PM, within sixty days of the date of this memorandum, notify the landowners of the decision and provide copies of the notification letter to CEMP-RF and CEHND-PM-OT.

b. The proposed OEW projects should be included in the DERP-FUDS workplans and database. All contracts should be awarded before the end of the third quarter of any fiscal year.

c. CENPD ensure that the PM updates the DERP-FUDS database within thirty days of the date of this memorandum. CEHND will periodically screen the database to ensure that the geographical districts have provided the required update.

6. The POC at this HQ is Mr. Mohinder Saini, (202) 272-1594.

FOR THE DIRECTOR OF MILITARY PROGRAMS:

Thomas J. Wash
for CARY JONES
Chief, Environmental Restoration Division
Directorate of Military Programs

CF:
CENPD-PM-MP (Han)
CEHND-PM-ED (Britton)
CENPP-PE-DC (Gross)

SITE SURVEY SUMMARY SHEET
FOR
DERP-FUDS SITE NO. F10OR004100
CAMP ABBOTT, OREGON
13 OCTOBER 93
(Revised 6 April 1994)

SITE NAME: Camp Abbott, Oregon

LOCATION: Deschutes County, Oregon, west of the community of Sunriver, Oregon.

SITE HISTORY: In October 1942, 8,672.45 acres of land were acquired by the Army by permit from the Department of Agriculture, U.S. Forest Service (USDA-USFS). There were also 984.84 acres of fee land and 29.12 acres of easements acquired from private parties. The land was initially acquired for use as an Army Engineering Replacement and Training Center and was later transferred to the Navy. Records indicate that many improvements were constructed on the site, including quarters, hospital facilities, ordnance support facilities, coal storage facilities, motor pool facilities, a stockade, a gas chamber for training, several bridges built for training and camp use, a sanitary sewage treatment plant, ordnance storage magazines, several small arms firing ranges, grenade practice ranges, and artillery practice ranges. In April 1946, the Army declared the property as surplus and transferred the land to the War Assets Administration for disposal. In November 1947, the permit (for 8,672.45 acres) was surrendered to USDA-USFS and the 984.84 acres of fee and 29.12 acres of easement lands were transferred to the Federal Land Bank for resale. The permit lands were returned to the Deschutes National Forest and the fee and easement lands became part of the Sunriver Resort development. The buildings and the area east of the Deschutes River have been heavily developed as part of the Sunriver Resort.

SITE VISIT: On 24 May 1993, Jerry Gardenhire and John Todd, CENPP-PE-DC, visited the site with Mr. Joe Hunt from the Bend Ranger District, Deschutes National Forest. Prior to the site visit, Mr. Hunt was interviewed over the telephone.

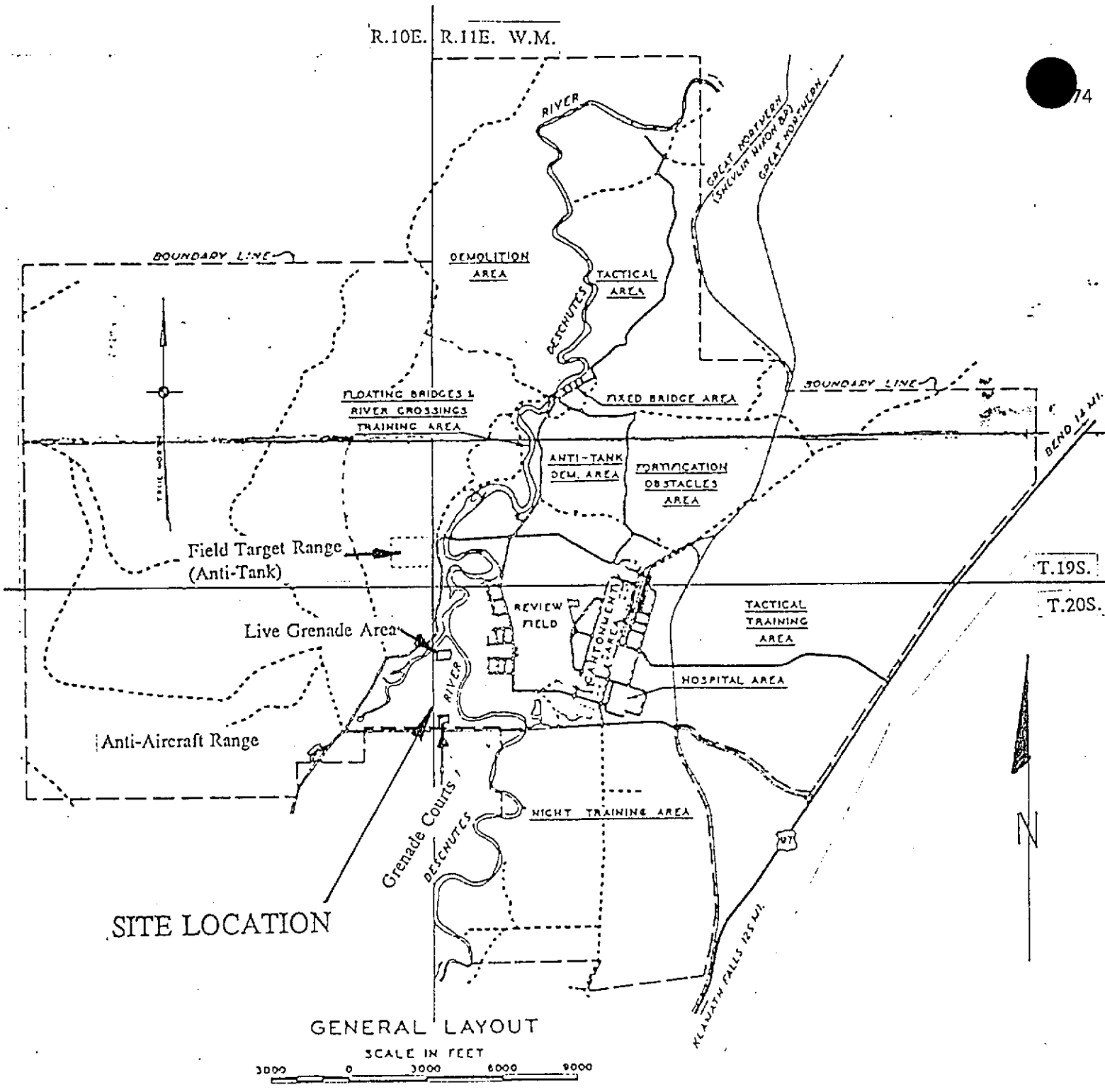
CATEGORY OF HAZARD: BD/DR and OEW.

PROJECT DESCRIPTION: There are two potential projects at the site.

a. BD/DR. The site contains a collapsing wood stringer bridge and a bridge abutment with protruding steel anchor pins. Both structures are climbing, falling, and tripping hazards. These hazards are located on Federal land.

b. OEW. The site contains small arms, artillery, and grenade practice ranges. Hazardous waste may be present at the site.

PA POC: Michael Gross, CENPP-PE-DC, (503) 326-6489.



SITE MAP

Camp Abbott
Site No.F10OR004100

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM
FOR FORMERLY USED SITES
FINDINGS AND DETERMINATION OF ELIGIBILITY
DESCHUTES NATIONAL FOREST (CAMP ABBOT), BEND, OREGON
PROJECT NO. F10OR004100

FINDINGS OF FACT

1. A debris removal project is proposed on land situated in Deschutes National Forest near Bend, Oregon, which is under the control of the Forest Service of the U.S. Department of Agriculture (USDA). The project involves the removal of several concrete building foundations, a small concrete and wood bridge, and a concrete bridge abutment, resulting from the Department of Defense's (DOD's) use of the property. The decaying bridge, bridge abutment, and building foundations are considered to be a threat to the health and safety of the public visiting this portion of the Deschutes National Forest.

2. The former Camp Abbot site occupies 8,672.45 acres of USDA lands permitted to the Army pursuant to directives issued by the Under Secretary of War dated 29 October 1942. Fee ownership totaling 984.84 acres and easement interest totaling 29.12 acres were acquired on privately owned lands. Ninety-five buildings were constructed on the site. Forty were transferred to the Navy and 55 were reported to the War Assets Administration (WAA) for off-site removal. Records concerning the buildings transferred to the Navy are incomplete; however, as a result of a recent inspection of the site, it is apparent that buildings have been removed from the Camp Abbot area. The decaying bridge, abutment, and building foundations are all located on USDA lands, and according to the best information available, it has been determined that these improvements are the remains of structures placed there by DOD.

3. The Camp Abbot installation was used as an engineering replacement and training center. The site was activated in May 1943. The property was never placed under any other control than by DOD during the period of DOD interest.

4. On 14 April 1946, the fee and easement lands were determined to be surplus and reported to WAA, who in turn assigned them to the Federal Land Bank for resale. The permitted USDA lands were returned to USDA on 18 November 1947. The fee and easement lands are now part of the Sun River Resort. The only DOD structural improvement remaining on the fee and easement lands is a log house which has been improved and added to, and is being used as a conference hall by the Sun River Resort.

5. There have been no beneficial uses for the proposed project areas by either USDA or by third parties.

DETERMINATION

Based on the foregoing findings of fact, the site has been determined to have been formerly used by DOD. Moreover, it is determined that an environmental restoration project, to the extent set out herein, is an appropriate undertaking within the purview of the Defense Environmental Restoration Program, established under Public Law 98-473, Continuing Appropriation, 1985 [Conference Report (HR 98-1159)], for the reasons stated above.

31 Jan 86
Date

LLOYD A. DUSCHA, P.E.
Deputy Director
Directorate of Engineering
and Construction

PROJECT SUMMARY SHEET
FOR
DERP-FUDS BD/DR PROJECT F10OR004101
CAMP ABBOTT, OREGON
SITE NO. F10OR004100
13 OCT 93
(Revised 6 April 1994)

PROJECT DESCRIPTION: The site contains a wood stringer bridge covered with a concrete slab and a bridge abutment with exposed steel anchor pins. The bridge is approximately 9-1/2' wide (outside dimensions) x 81' long x 6' high at the center of the bridge. It has a deck of approximately 4 inches of concrete and expanded metal lath, some of which is exposed. The steel anchor pins are located in the top of an abandoned concrete bridge abutment that is approximately 2-1/2 feet tall. There are five 1 inch diameter X 10 inch long pins exposed. The BD/DR hazards are located on Federal land.

PROJECT ELIGIBILITY: Records indicate that all the facilities were built and used by the Army. The climbing, tripping, and falling debris hazards resulted from DOD activities, but did not exist at the time DOD usage ceased.

POLICY CONSIDERATIONS: This project is located on Federal land (the Deschutes National Forest, Oregon) and is therefore not eligible.

PROPOSED PROJECT: The wood stringer bridge and bridge abutment anchor pins do not meet eligibility criteria and policy considerations. Therefore, no BD/DR project is proposed for this site. Asbestos containing materials are not addressed for this site.

PROJECT COST ESTIMATE: Not developed.

POC: Michael Gross, CENPP-PE-DC, (503) 326-6489.

PROJECT SUMMARY SHEET
FOR
DERP-FUDS OEW PROJECT F10OR004102
CAMP ABBOTT, OREGON
SITE NO. F10OR004100
14 OCT 93

78

PROJECT DESCRIPTION: This is a former Army base where engineer troops were trained prior to assignment to theaters of operations during World War II. Small arms, artillery, and grenade practice ranges and ordnance storage magazines were constructed and used on-site. An artillery round and a bazooka round have been found west of the Sunriver Resort and have been reported to the Deschutes County Sheriff's Department. Spent mortar and rocket rounds have been found on the Sunriver Resort grounds. No other munitions have been found.

PROJECT ELIGIBILITY: Records indicate that the area was used by the Army for training of engineer troops prior to assignment during World War II.

POLICY CONSIDERATIONS: There is no policy applicable to this project.

PROPOSED ACTIVITIES: The INPR should be referred to CEHND for a determination of further action.

RAC: Attached. The RAC score is II-B, 2.

POC: Michael Gross, CENPP-PE-DC, (503) 326-6489.

Encl

Form Rev. 2/10/93

RISK ASSESSMENT PROCEDURES FO ORDNANCE AND EXPLOSIVE WASTE (OEW) SITES

Site Name	Camp Abbott	Rater's Name	Jerry R. Gardenhire
Site Location	Deschutes County, Oregon	Phone Number	(503) 326-6488
DERP Project #	F10OR004102	Organization	CENPP-PE-DC
Date Completed	October 14, 1993	RAC	II-B RAC 2

OEW RISK ASSESSMENT:

This risk assessment procedure was developed in accordance with MIL-STD 882B and AR 385-10. The RAC score will be used by CEHND to prioritize the remedial action at this site. The OEW risk assessment should be based upon best available information resulting from records searches, reports of Explosive Ordnance Disposal (EOD) detachment actions, and field observations, interviews, and measurements. This information is used to assess the risk involved based upon the potential OEW hazards identified at the site. The risk assessment is composed of two factors, hazard severity and hazard probability. Personnel involved in visits to potential OEW sites should view the CEHND videotape entitled "A Life Threatening Encounter: OEW."

Part I. Hazard Severity. Hazard severity categories are defined to provide a qualitative measure of the worst credible mishap resulting from personnel exposure to various types and quantities of unexploded ordnance items.

TYPE OF ORDNANCE
(Circle all values that apply)

A. Conventional Ordnance and Ammunition

		VALUE
Medium/Large Caliber (20 mm and larger)	10	
Bombs, Explosive		10
Grenades, Hand and Rifle, Explosive		10
Landmines, Explosive		10
Rockets, Guided Missiles, Explosive		10
Detonators, Blasting Caps, Fuzes, Boosters, Bursters		6
Bombs, Practice (w/spotting charges)		6
Grenades, Practice (w/spotting charges)		4
Landmines, Practice (w/spotting charges)		4
Small Arms (.22 cal - .50 cal)		1
Conventional Ordnance and Ammunition (Select the largest single value)		10

What evidence do you have regarding conventional OEW? An artillery round and a bazooka round were found west of the Sunriver Resort. In addition, spent mortar and rocket rounds have been found northwest of the Sunriver airstrip.

B. Pyrotechnics (For munitions described above.)

	VALUE
Munitions (Container) Containing White Phosphorus or other Pyrophoric Material (i.e., Spontaneously Flammable)	10
Munition Containing A Flame or Incendiary Material (i.e., Napalm, Triethlaluminum Metal Incendiaries)	6
Flares, Signals, Simulators	4
Pyrotechnics Value (Select the largest single value)	0

What evidence do you have regarding pyrotechnics? No evidence of pyrotechnic OEW has been found during the past 50 years of use of the site.

C. Bulk High Explosives (Bulk explosives not an integral part of conventional ordnance; uncontainerized.)

	VALUE
Primary or Initiating Explosives (Lead Styphnate, Lead Azide, Nitroglycerine, Mercury Azide, Mercury Fulminate, Tetracene, etc.)	10
Demolition Charges	10
Secondary Explosives (PETN, Compositions A, B, C, Tetryl, TNT, RDX, HMX, HBX, Black Powder, etc.)	8
Military Dynamite	6
Less Sensitive Explosives (Ammonium Nitrate, Explosive D, etc.)	3
High Explosives (Select largest single value)	0

What evidence do you have regarding bulk explosives? No evidence of bulk high explosive OEW has been found during the past 50 years of use of the site.

D. Bulk Propellants (Not an integral part of rockets, guided missiles, or other conventional ordnance; uncontainerized)

	VALUE
Solid or Liquid Propellants	6
Propellants	0

What evidence do you have regarding bulk propellants? No evidence of propellant OEW was found during the past 50 years of use of the site.

E. Radiological/Chemical Agents/Weapons

	VALUE
Toxic Chemical Agents (Choking, Nerve, Blood, Blister)	25
War Gas Identification Sets	20
Radiological	15
Riot Control and Miscellaneous (Vomiting, Tear, incendiary and smoke)	5
Radiological/Chemical Agent/Weapons (Select the largest single value)	0

What evidence do you have regarding chemical/radiological OEW? No evidence of chemical/radiological OEW has been found during the past 50 years of use of the site.

==========

Total Hazard Severity Value 10
(Sum of Largest Values for A through E--Maximum of 61).
Apply this value to Table 1 to determine Hazard Severity Category.

TABLE 1

HAZARD SEVERITY

Description	Category	Value
CATASTROPHIC	I	≥ 21
CRITICAL	II	≥ 10 < 21
MARGINAL	III	≥ 5 < 10
NEGLIGIBLE	IV	≥ 1 < 5
**NONE		0

***Apply Hazard Severity to Table 3.**

**If Hazard Severity Value is 0, you do not need to complete Part II. Proceed to Part III and use a RAC Score of 5 to determine your appropriate action.

Part II. Hazard Probability. The probability that a hazard has been or will be created due to the presence and other related factors of unexploded ordnance or explosive materials on a formerly used DOD site.

AREA, EXTENT, ACCESSIBILITY OF OEW HAZARD
(Circle all values that apply)

A. Locations of OEW Hazards

	VALUE
On the surface	5
Within Tanks, Pipes, Vessels or Other confined Locations.	4
Inside walls, ceilings, or other parts of Buildings or Structures.	3
Subsurface	2
Location (Select the single largest value)	5

What evidence do you have regarding location of OEW? The artillery round is assumed to have been found on the surface, since there is no detail about the actual location in the records. The interview with the person who found the bazooka round said she "kicked the round out of the ground", which implies it was at least partially buried.

B. Distance to nearest inhabited locations or structures likely to be at risk from OEW hazard (roads, parks, playgrounds, and buildings).

	Value
Less than 1250 feet	5
1250 feet to 0.5 mile	4
0.5 mile to 1.0 mile	3
1.0 mile to 2.0 miles	2
Over 2.0 miles	1
Distance (Select the single largest value)	2

What are the nearest inhabited structures? The distances reported were between 1/2 and 1 mile west of the Sunriver Resort.

C. Numbers and types of Buildi[illegible] within a 2 mile radius measured from the C[illegible] hazard area, not the installation boundary.

	Value
26 and over	5
16 to 25	4
11 to 15	3
6 to 10	2
1 to 5	1
0	0
Number of Buildings (Select the single largest value)	5

Narrative The reported locations for the artillery round and the bazooka round are west, across the Deschutes River, from the Sunriver Resort. There are both vacation and permanent residences at the Resort.

D. Types of Buildings (within a 2 mile radius)

	Value
Educational, Child Care, Residential, Hospitals, Hotels, Commercial, Shopping Centers, etc.	5
Industrial Warehouse, etc.	4
Agricultural, Forestry, etc.	3
Detention, Correctional	2
No Buildings	0
Types of Buildings (Select the largest single value)	5

Describe types of buildings in the area. There are both vacation and permanent residences, restaurants, a hotel, tennis courts, stables, bicycle rental shop, boat rental shop, and other commercial shops within the 2 mile radius of the OEW site boundary.

E. Accessibility to site refers to ss by humans to ordnance and explosive w . Use the following guidance:

BARRIER	VALUE
No barrier or security system	5
Barrier is incomplete (e.g., in disrepair or does not completely surround the site). Barrier is intended to deny egress from the site, as for a barbed wire fence for grazing.	4
A barrier, (any kind of fence in good repair) but no separate means to control entry. Barrier is intended to deny access to the site.	3
Security guard, but no barrier	2
Isolated site	1
A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) which continuously monitors and controls entry onto the facility; or An artificial or natural barrier (e.g., a fence combined with a cliff), which completely surrounds the facility; and a means to control entry, at all times, through the gates or other entrances to the facility (e.g., an attendant, television monitors, locked entrances, or controlled roadway access to the facility).	0
Accessibility (Select the single largest value)	5

Describe the site accessibility. The sites are separated from the resort by the Deschutes River, however, there is a footbridge across the river providing access to the sites. There are no fences to secure the areas, which are open to the public using the national forest.

F. Site Dynamics - This deals with site conditions that are subject to change in the future, but may be stable at the present. Examples would be excessive soil erosion by beaches or streams, increasing land development that could reduce distances from the site to inhabited areas or otherwise increase accessibility.

	VALUE
Expected	5
None Anticipated	0
Site Dynamics (Select the single largest value)	0

Describe the site dynamics. The sites are located on national forest land, not open to development, but the areas are open to additional, limited logging.

Total Hazard Probability Value
(Sum of Largest Values for A through F--Maximum of 30) 22
Apply this value to Hazard Probability Table 2 to determine Hazard Probability Level.

TABLE 2

HAZARD PROBABILITY

Description	Level	Value
FREQUENT	A	≥ 27
PROBABLE	B	$\geq 21 < 27$
OCCASIONAL	C	$\geq 15 < 21$
REMOTE	D	$\geq 8 < 15$
IMPROBABLE	E	≤ 8

*Apply Hazard Probability to Table 3.

Part III. Risk Assessment. The assessment value for this site is determined using the following Table 3. Enter with the results of the hazard probability and hazard severity values.

TABLE 3

Probability Level		FREQUENT A	PROBABLE B	OCCASIONAL C	REMOTE D	IMPROBABLE E
Severity Category:						
CATASTROPHIC	I	1	1	2	3	4
CRITICAL	II	1	2	3	4	5
MARGINAL	III	2	3	4	4	5
NEGLIGIBLE	IV	3	4	4	5	5

RISK ASSESSMENT CODE (RAC)

RAC 1 Imminent Hazard - Expedite INPR - Immediately call CEHND-ED-SY--commercial 205-955-4968 or DSN 645-4968.

RAC 2 High priority on completion of INPR - Recommend further action by CEHND.

RAC 3 Complete INPR - Recommend further action by CEHND.

RAC 4 Complete INPR - Recommend further action by CEHND.

RAC 5 Recommend no further action. Submit NOFA and RAC to CEHND.

==========

Part IV. Narrative. Summarize the documented evidence that supports this risk assessment. If no documented evidence was available, explain all the assumptions you made.

Based on our telephone interviews with Joe Hunt, Bend Ranger District Resource Assistant, Deschutes County Emergency Services, and the Sunriver Nature Center, various forms of OEW have been found and reported in and adjacent to the Resort, still in the area of the former Army base. An artillery round, a bazooka round, spent mortar and rocket rounds have been found. During our site inspection, we found no evidence of OEW at the "Field Target Range". Our records are incomplete concerning this site, therefore, we recommend further research be conducted to determine the extent of OEW contamination.

CONTACT LISTING

1. Federal Government--U.S. Department of Agriculture, Forest Service (USDA-FS), Deschutes National Forest, Bend Ranger District; 1230 NE Third Street; Bend, Oregon 97701; Telephone Number: (503) 388-5662

a. Contact Name: Jill Ortlery

--Interview Information: Ms. Ortlery contacted the Corps of Engineers (after a request for information about the Northwest Maneuver Area, an adjacent DERP-FUDS site was released in the Bend area) concerning a bazooka round she "kicked out of the ground", west of Sunriver. She said that she placed the round against a tree and then called us. The location was approximately 1-1/2 miles west of Sunriver on Forest Road 40. The site was in a beetle kill area and was opened to the general public for wood cutting in 1988.

b. Contact Name: Joe Hunt, Resource Assistant

--Interview Information: John Todd, CENPP-PE-DC, contacted Mr. Hunt about remnant DOD materials on the former Camp Abbott site. Mr. Hunt told John that he wasn't aware of any OEW being found but he did know where several of the former target ranges were located, in addition to the structural remnants. Mr. Hunt gave John directions to find the site in case he could not go with us on our site inspection.

2. Deschutes County Emergency Services (County Sheriff's Office)

a. Contact Name: Sgt. Terry Silbaugh

b. Address: 1100 NW Bond; Bend, Oregon 97701

c. Telephone Number: (503) 388-6502

d. Interview Information: Sgt. Silbaugh was contacted by Jerry Horrocks, (ex-)CENPP-PE-DC, concerning the bazooka round found by Ms. Ortlery of the Forest Service. He said he would call Ms. Ortlery and "take care of the ordnance" (in 1988). Approximately one week later, Jerry Horrocks contacted Sgt. Silbaugh to find out the disposition of the ordnance. Sgt. Silbaugh had called the 53rd Ordnance Detachment from Yakima Firing Range, Washington (ph. [509] 457-8992) after the Sheriff's Office sent someone out to look at the round. The markings were deteriorated. The 53rd Detachment said that "it was definitely something not to let lay around for the public to pick up." The 53rd sent someone out to the site and identified the round to be a "2.36-inch rocket, of late World War II or Korean War vintage that was probably used for Anti-Tank warfare." The

53rd Detachment supposedly removed the round and destroyed it.ow much about the site, except how to get there. During the preparation of the INPR for the Northwest Maneuver Area, another reference to OEW surfaced. Apparently, an artillery round was discovered west of Sunriver, and the Deschutes County Emergency Services office was contacted.

3. Sunriver Nature Center

a. Contact Name: Mr. David Danley

b. Address: Sunriver Nature Center; Sunriver Lodge and Resort; Sunriver, Oregon 97707

c. Telephone Number: (503) 593-4394

d. Interview Information: Mr. Danley was contacted by Bill Clement, CENPPEN-GR (old office designation), concerning the Northwest Maneuver Area. During the conversation, Mr. Danley said that "Live ammunition was used. Firing ranges for small arms and mortar rockets were active on post (spent mortar and rocket rounds are still occasionally found near a cliff N.W. of the airstrip (across Cardinal landing bridge)." No recent conversations with Mr. Danley were held.

APPENDIX E

LETTERS / MEMORANDA / MISCELLANEOUS ITEMS

ORDNANCE AND EXPLOSIVE WASTE
CHEMICAL WARFARE MATERIALS
ARCHIVES SEARCH REPORT
FINDINGS
for
CAMP ABBOT
Deschutes County, Oregon

Project No. F10OR004102

APPENDIX E

LETTERS/MEMORANDA/MISCELLANEOUS ITEMS

E-1 Chemical Clearance - U.S. Army Corps of Engineers Letter from R.W. Love to Property Management Division, Washington, D.C., dated 25 September 1946.

E-2 Decontamination and Dedudding - U.S. Army Corps of Engineers Letter from Charles Cohn to the Federal Land Bank of Spokane, Spokane, WA, dated 30 October 1946.

E-3 Explosive Clearance - U.S. Army Corps of Engineers Letter from Peter Goerz to the U.S. Forest Service, Washington, D.C., dated 18 November 1947.

reply refer to: 602
Camp Abbot, Oregon ENGLT

WAR DEPARTMENT
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON

25 September 1946

The Administrator,
War Assets Administration
Railroad Retirement Building
WASHINGTON 25, D.C.

Attn: Property Management Division
Office of Real Property Disposal
Mr. Strickler.

Dear Sir:

Reference is made to our letter of 14 August 1946 concerning dedudding of surplus target ranges. In that letter it was stated that final information on certain installations would be supplied at a later date. A report has been received from the Division Engineer, North Pacific Division, Portland, Oregon, that Camp Abbot, Oregon, was dedudded in November of 1944 and has not been used since that date. A recent inspection of Camp Abbot was made by the Chemical Officer of the 6th U. S. Army to determine whether poisonous gases were present on the area. This inspection showed that the land was free of any such contamination.

Camp Abbot is considered suitable for normal use in accordance with Section 1, Circular 195, War Department, 29 June 1945.

FOR THE CHIEF OF ENGINEERS:

Sincerely yours,

/s/RWLove

R.W. Love
Lt. Colonel, Corps of Engineers
Chief, Disposal Branch
Management and Disposal Division
Real Estate

COPY/nr/9/27/46

ROUTE TO
22
File

ADDRESS REPLY TO
THE DIVISION ENGINEER
(NOT TO INDIVIDUALS)

NPDRM

WAR DEPARTMENT
CORPS OF ENGINEERS
OFFICE OF THE DIVISION ENGINEER
NORTH PACIFIC DIVISION
500 PITTOCK BLOCK
PORTLAND 5, OREGON

October 30, 1946

REFER TO FILE NO. NPD 602.2(~~Camp~~ Abbot, Oregon)

Federal Land Bank of Spokane
610 Main Avenue
Spokane 8, Washington

ATTENTION: Mr. H. L. DeLaney
Assistant District Supervisor

Gentlemen:

This certifies that Camp Abbot, Oregon, has been inspected for decontamination and dedudding and that said camp is hereby declared safe for return to private use.

FOR THE DIVISION ENGINEER:

Very truly yours,

CHARLES S. COHN
Chief, Management & Disposal Branch
Real Estate Division

cc - War Assets Administration
Swan Island, P. O. Box 4062
Portland, Oregon

cc - Engineer Branch, NPD

To be Handled by .....
..... Answered
..... Ans'd by Routine Advice
..... No Answer Required

Directed to File
By .....
Surname

FILE ONLY WHEN SIGNED

This Paper must be returned to ORPD Master

OCT 31 1946

E-2

602 Camp Abbot, Oregon.
ENGLT

EG/lj
HO'N
L&K
GFM

18 November 1947

The Chief,
United States Forest Service,
Department of Agriculture,
Washington, D.C.

Dear Sir:

Permits from the Secretary of Agriculture dated December 10, 1942 and May 26, 1943, covering the right to use for military purposes approximately 8,672.45 acres of National Forest Land, were granted to the Department of the Army in connection with Camp Abbot, Oregon. The lands are located in Townships 19 and 20 South, Ranges 10 and 11 East of the Willamette Meridian.

The lands are no longer required by the Department of the Army and the aforesaid permits are hereby relinquished. No restoration work is deemed necessary by this Department. The lands have been examined and have been cleared of all explosives or explosive objects reasonably possible to detect by visual inspection. Inclosed is a copy of letter dated 31 July 1947 from the Regional Forester advising that the lands are in satisfactory condition.

The cooperation of the Department of Agriculture in making these lands available for use by the Department of the Army is appreciated.

FOR THE CHIEF OF ENGINEERS:

Sincerely yours,

PETER P. GOERZ
Colonel, Corps of Engineers
Assistant Chief of Engineers for Real Estate

1 Inclosure:
Cy ltr dtd 31
July 1947

Encl 1

E-3

APPENDIX F

REAL ESTATE DOCUMENTS

REALTY CONTROL FILE SUMMARY
(Land Acquisitions and Disposals Subsequent to 1 July 1940)

2054

RESERVATION NAME:

Camp Abbott, Oregon

OFFICIALLY DESIGNATED BY:

LOCATION:

In Deschutes County, 11 miles Southwest of Bend, Oregon

TYPE:

Engineer Replacement & Training Center

LAND OWNERSHIP AND COST DATA

ACQUISITION ACTIONS	DISPOSAL ACTIONS
Exhibits "A"	Exhibits "B"

NET AREA (LEASED ACREAGE NOT INCLUDED — SEE TRACT REGISTER AND MAP)	GROSS COST
8,672.45 acres, transferred *	
984.84 acres, fee	
29.12 acres, easement (1)	
0.00 of an acre, licenses(6)	
9,686.41 acres, total area acquired	$12,844.00
9,686.41 acres, **	
0.00	

JURISDICTION

Exhibit "C"

RELOCATIONS

FINAL PROJECT MAP:

Exhibit "F"

MISCELLANEOUS PAPERS:

Exhibits "E"

REMARKS:

* Use Permit fr. Dept. of Agriculture - 12-30-42 as amended 5-26-43 and 9-3-43.

** 0.00 of an acre, license (1), terminated, 1-25-45.
0.00 of an acre, license (2), terminated, 3-3-45.
984.84 acres, fee, 29.12 acres, easement (1), 0.00 of an acre license (1), accountability assumed by F.L.B., 4-12-46.
0.00 of an acre, licenses (2), terminated, 11-1-46.
1803 8,672.45 acres, relinquished to Dept. of Agriculture, 11-18-47.

Office Memorandum • UNITED STATES GOVERNMENT

CE 601.1 (Camp Abbott, Oregon) SPEIR

TO (1)Chief, Purchase Branch; (2) Chief, Leasing Branch DATE: 19 December 1945

FROM : Director of Real Estate

MLG/ehd

SUBJECT: Change in Estate To Be Acquired

CERTIFIED FOR THE FISCAL OFFICER, OCE JC BAT

1. Directive RE-D 1844, dated 29 October 1942, authorized the acquisition of 12,088 acres of land for Camp Abbott, Oregon, of which 5,348 acres were Government owned, being a part of Deschutes National Forest. The remaining 6,740 acres were privately owned and $56,245 was made available to acquire the fee simple title therein. CGM

2. Directive RE-D 1844-B, dated 3 September 1943, authorized the elimination of Tract C containing 1,430.76 acres of the land which was authorized to be acquired in fee by the directive mentioned in paragraph one above.

3. As noted in the report of the Division Engineer, Pacific Division, contained in first indorsement dated 6 July 1945, because of certain booming rights on the Deschutes, the area shown in yellow on the inclosed map dated 1 July 1944, marked "Directive Map - Original" and entitled "Abbott Camp - Engineer Replacement Center, Military Reservation", and designated A-1 and A-1-B, has not been acquired in fee in accordance with the aforementioned directive.

4. This installation is no longer active and, based upon the recommendation of the Division Engineer, Pacific Division, by 1st Indorsements dated 12 September and 31 October 1945, it is to the best interest of the Government to amend the directive mentioned in paragraph one above to provide for the acquisition of a leasehold interest in Tract A-1 for the period of occupancy ending 4 November 1945, in lieu of fee simple title as previously authorized. Because of excessive restoration, Tract A-1-B, containing 464 acres, will be acquired in fee at this time as originally authorized, and the leasehold interest effective since 4 November 1942 will be satisfied and cancelled.

5. Because of the change of estate to be acquired in Tract A-1, it is necessary to acquire a permanent easement over approximately 1 acre of the existing road right-of-way, known as Military Road, across that portion of Lot 3, Section 31, T. 19 S., R. 11 E., W.B. & M., as shown in brown on the inclosed map.

6. It is noted that Tract A-3, which has been acquired in fee, will be surrounded by leased land. The acquisition of a leasehold interest in this tract in lieu of fee title therein cannot be effected because it was acquired by warranty deed dated 7 November 1942, and revestment of title in the former owner is not possible.

RE-D 1844-C

RE-D 184-CFwd. to Purchase Branch 20 December 1945

FERENAC

SUBJECT: Change in Estate To Be Acquired, Camp Abbott, Oregon

7. No declarations of taking have been filed against Tract A-1, and no options accepted by the War Department.

8. Sufficient funds for this acquisition are available from funds previously authorized for the acquisition of this installation.

9. Pursuant to General Directive issued by the Under Secretary of War, dated 27 August 1945, Directive RE-D 1844 dated 29 October 1942 is amended accordingly and it is requested that action be taken to acquire the necessary real estate interests as outlined above.

O'BRIEN

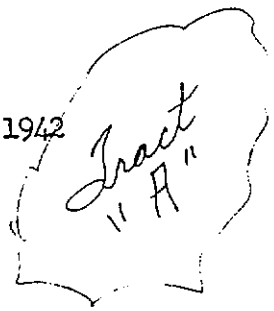
Attached:
#1 - Ltr 13 Aug 45 fm OCE to PD w/1 Ind
#2 - Ltr 22 Oct 45 fm OCE to PD w/1 Ind
#3 - Directive Map - Original
#4 - Ltr 13 Jun 45 fm Portland SubOfc to PD w/1 Ind

SEATTLE COE

DEPARTMENT OF AGRICULTURE

WASHINGTON

December 30, 1942



The Honorable
The Secretary of War

Dear Mr. Secretary:

The Forest Service states that the Regional Forester at Portland Oregon, has received a request from local Army Engineers for the use, for establishment and maintenance of a military training camp and related activities, of the following-described area within the Deschutes National Forest, Oregon.

> Secs. 25, 26, 35, and 36, T. 19 S., R. 10 E., W. M.; $N\frac{1}{2}$, $N\frac{1}{2}SW\frac{1}{4}$, $SW\frac{1}{4}SW\frac{1}{4}$, $SE\frac{1}{4}SE\frac{1}{4}$ Sec. 1, all of Sec. 2, $NW\frac{1}{4}NW\frac{1}{4}$ Sec. 12, T. 20 S., R. 10 E., W. M.; all of Sec. 19, $N\frac{1}{2}$, $SW\frac{1}{4}$ Sec. 30, Lot 4 Sec. 31, T. 19 S., R. 11 E., W. M.; Lot 3 Sec. 5, and Lot 4 Sec. 6, T. 20 S., R. 11 E, W.M.; containing approximately 4,918.99 acres.

In addition to the above-described lands, it is understood that use is desired of the $SE\frac{1}{4}SW\frac{1}{4}$, $SW\frac{1}{4}SE\frac{1}{4}$ Sec. 17, and $W\frac{1}{2}NE\frac{1}{4}$ Sec. 20, T. 19 S., R. 11 E., W. M., as soon as the consummation of condemnation proceedings instituted to acquire a clear title has made the lands a part of the Deschutes National Forest.

The proposed use and occupancy by the War Department would adversely affect the program of the Forest Service in the following respects: (1) Require relocation of certain telephone lines necessary for the protection and administration of the national forest because they traverse a proposed small caliber artillery range; (2) possibly require closure to public travel of that portion of the South Century Drive located in the $NW\frac{1}{4}NW\frac{1}{4}$ Sec. 12, T. 20 S., R. 10E., such closure necessitating provision of a detour around the proposed training center; (3) possibly damage or destroy the Forest Service improvements or facilities within the area other than the communication system.

This Department recognizes that the adverse conditions above-cited are wholly subordinate to the requirements of national defense, consequently it will not withhold its consent to the occupancy and use by your Department of the lands first described. It does, however,

feel that if the funds appropriated to your Department legally may be expended for the relocation or replacement of the roads, structures, and other facilities involved, an arrangement to that end would be equitable and desirable. As an alternative to the performance of such relocation and replacement work by agencies of your Department, the transfer from your appropriations to this Department of sums sufficient to enable it to perform such work with its own personnel has much to commend it. Subject to one of these suggestions and to any valid rights or claims which may exist, occupancy by your Department of the lands now under the jurisdiction of this Department, as above described, is hereby authorized.

As soon as title to the second described area is vested in the United States, the permission herein granted can be considered as applying also to that additonal area.

The Regional Forester has reported that, in addition to any other possible claims, a portion of the area is apparently covered by a first form reclamation withdrawal. Conflict between military and reclamation uses of these lands in the near future appears improbable, but you may wish to clear with the Department of the Interior.

The details of use and occupancy, including cancellation of any existing permits and removal of any structures which would interfere with utilization of the area by the Army, can best be agreed to by local representatives of the two Departments; accordingly it is suggested that the commanding officer of the proposed encampment consult with the Regional Forester at Portland, Oregon, or such officers of the Deschutes National Forest as the latter may designate, to the end that all questions of management, protection, and administration of the area and proper adjustment thereof be developed and set forth in a memorandum of understanding between our respective field representatives.

Sincerely,

/s/ Groover B. Hill

Assistant Secretary

COPY

APPENDIX G

NEWSPAPERS / JOURNALS

ORDNANCE AND EXPLOSIVE WASTE
CHEMICAL WARFARE MATERIALS
ARCHIVES SEARCH REPORT
FINDINGS
for
CAMP ABBOT
Deschutes County, Oregon

Project No. F10OR004102

APPENDIX G - NEWSPAPERS/JOURNALS

G-1 "Fireworks with a Sting", article from the *Abbot Engineer*, January 8, 1944, showing ERTC demonstration.

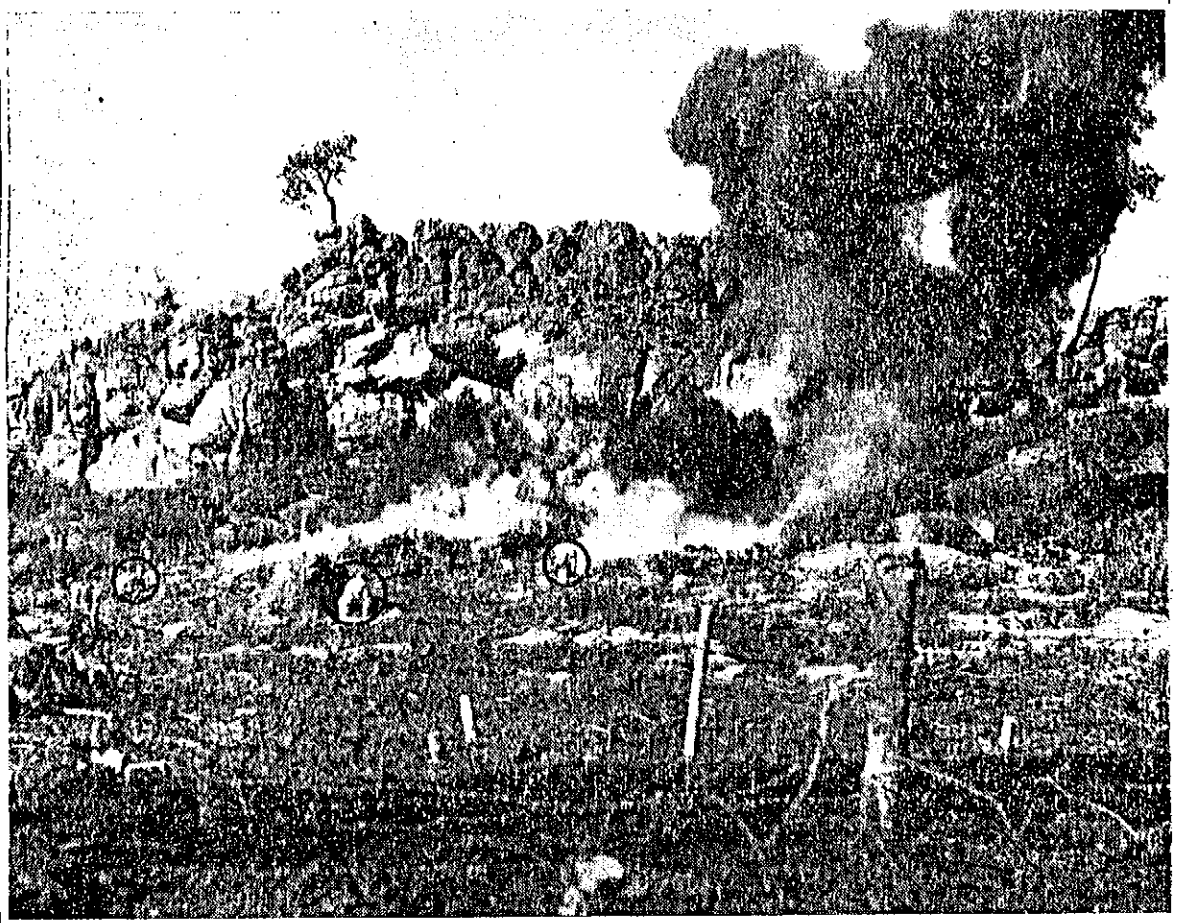
G-2 "Trainees Taught to Hit at Enemy Pillboxes", article from the *Abbot Engineer*, February 12, 1944.

G-3 "Special Chemical Warfare Classes Underway Here", *Abbot Engineer*, date unknown.

FIREWORKS WITH A STING

This pyrothechnic-like demonstration is used by the Chemical Warfare Branch at Camp Abbot to show soldiers of the Engineer Replacement Training Center various uses of white phosphorous in modern warfare. The chemical, which burns furiously and is almost impossible to extinguish, was used successfully in the Salerno campaign and in Sicily to "burn" enemy soldiers from fox holes and to set up smoke screens.

CANNED HEAT· ERTC STYLE



Here's an idea of the inferno soldiers undergoing specialist training on Camp Abbot's new assault and demolition course create with their flame throwers as they sneak up on "enemy" pill boxes. Once the flame throwers have burned out their victims, a demolition squad goes to work to make certain the foes gives up all thoughts of again occupying positions.

☆ ☆ ☆ ☆ ☆ ☆

Trainees Taught to Hit At 'Enemy' Pillboxes

Knocking out pill boxes is rapidly becoming second nature to trainees of the Engineer Replacement Training Center who are selected for specialist training on Camp Abbot's new assault and demolitions course.

To make the course as realistic as possible, the Training Division has planned a course which incorporates many problems of actual warfare, including barbed wire entanglements and machine gun fire.

First step in the program is a "softening up" process involving the use of a tank, which appears on the scene and looses salvos at machine gun nests and pill boxes.

Set charges, so well timed that even the trainees are fooled, are fired from a control tower, concealed in a rocky hillside above the course, to give the appearance of shells fired from the tanks' guns.

Once the tank has done its job, a demolitions squad goes into action. Bangalore torpedoes are brought into play to clear the barbed wire entanglements and open a hole for advancing troops equipped with flame throwers.

The flame-thrower crew then moves in full speed, running the distance and taking full advantage of cover and shell holes, to burn what remains of the "enemy" from its positions.

Demolitions men again come to the fore to administer the coup de grace to the now blackened pill boxes, setting charges which complete destruction of the fortifications.

Official camp newspaper, published weekly in the interests of the personnel of Camp Abbot, Oregon, under supervision of the Special Service Officer. News matter pertaining to Camp Abbot is furnished by the Public Relations Branch and is available for general release.

Written contributions, art work and photographs are solicited and should be directed to the Public Relations Branch, Post Hdqs. Annex, Bldg. 202. Telephone Ext-8.

The ABBOT ENGINEER receives material supplied by Camp Newspaper Service, War Dep't., 205 E. 42nd St., New York, N. Y. Credited material may not be republished without permision of Camp Newspaper Service.

Distributed free to camp personnel. Subscription rate to public, by mail: 50 cents for three months; six months, $1.00; one year, $1.50.

Abbot 'n Around

Entertainment On and Off the Post for the Coming Week

SATURDAY

Service Club—Open House.
Station Hospital—Quiz Program, 7 p. m.
Bend USO—Dance, 8:30 p. m.

SUNDAY

Service Club—Open House.
Station Hospital—Red Cross Open House.
Classical Music program in Guest House lounge at 7:30 p.m.
Bend USO—Breakfast, 10 to 11 a. m. Buffet, 4 to 5 p. m. Music 4:30 to 5:30 p. m.

MONDAY

Service Club—GI Movies, 8:30 p. m.
Station Hospital—Slides of National Parks presented by Pvt. George Shelley, 51st Bn.

TUESDAY

Service Club—Bingo, 8:30 p. m.
Station Hospital—"Cowboy From Manhattan," 6:30 p. m.
Bend USO—Social Evening.

WEDNESDAY

Service Club—Informal Dance, 8:30 p. m.
Station Hospital—Community Sing; Open Forum.
Bend USO—Stamp Club.

THURSDAY

Service Club—"Khaki Kapers" show.
Station Hospital—St. Patrick's Party, 7 p. m.
Bend USO—Bingo, 8 p. m. Music Appreciation, 9 p. m.

FRIDAY

Service Club—"Record Your Voice" session.
Station Hospital—"Tales of Manhattan," Charles Laughton—, 6:30 p. m.
Bend USO—Decoration party.

Special Chemical Warfare Classes Underway Here

Preparing them to serve as unit gas defense personnel in field operations, 30 officers and non-coms are taking a 34-hour, two-weeks course in chemical warfare activities under Lt. L. S. Brooks, Chemical Warfare Officer.

The class, which opened last Monday, follows a War Department recommendation that certain personnel be given intensive training in order to fit them for instructor's posts as well as combat jobs. Similar classes, with volunteer personnel, may be held later if the need arises, Lt. Brooks said.

In the class are three Wacs and one nurse, with line cadre and E. R. T. C. men making up the balance of the group.

The program, consisting largely of practical work in the field, includes repair of gas masks, protective measures against all types of chemical warfare agents, offensive use of gas, first aid measures, knowledge and identity of gasses, fighting incendaries, handling violent mobs with gas, and night reconnaissance of gassed areas.

The program will include actual use of mustard and other vesicant gasses.

Article from the *Abbot Engineer* (the Camp Abbot newspaper)
The date is unknown, assumed to be in 1943.

APPENDIX H

INTERVIEWS

ORDNANCE AND EXPLOSIVE WASTE
CHEMICAL WARFARE MATERIALS
ARCHIVES SEARCH REPORT
FINDINGS
for
CAMP ABBOT
Deschutes County, Oregon

Project No. F10OR004102

APPENDIX H - INTERVIEWS

Person Contacted	Position/Organization
Mr. Anderson	Tele#503-389-1813 Deschutes Historical Society Idaho St. Bend, OR 97701
Mr. Ken Bell	Tele#503-252-6779 Retired Portland, OR
Daniel Buck	Tele#503-593-6645 Compliance Inspector Sunriver Owners Association P.O. Box 3278 Sunriver, OR 97707
Pierre Desantis	Tele#503-388-2715 Deschutes National Forest 1645 Hwy 20 East Bend, OR 97701
Ralph W. Giffin	Tele#503-388-6575 Community Development Dept. 1130 N.W. Harriman Bend, OR 97701
Sue Hinton	Tele#503-593-4394 Sunriver Nature Center Sunriver, OR 97707

Ron Myhrum	Tele#503-388-2138 Soil Conservation Service 20332 Empire Ave Suite F1 Bend, OR 97701
Michael O'Reilly	Tele#503-385-9198 Author, *Camp Abbot: Sunriver's Proud Roots.* Bend, OR 97701
Mike Renz	Tele#503-388-6146 Department of Env. Quality 2146 NE 4th St Suite 104 Bend, OR 97701
Sgt. Terry Silbaugh	Tele#503-388-6502 Deschutes County Sheriffs 1100 N.W. Bond Bend, OR 97701
Patrick Whelan	Director of Public Works Sunriver Owners Association P.O. Box 3278 Sunriver, OR 97707
Ted Wise	Tele#503-388-6363 Department of Fish and Wildlife 61374 Parrell Rd Bend, OR 97701

Sgt. Terry Silbaugh
Deschutes County Sheriff
503-388-6502

Sgt. Silbaugh stated that ordnance has been recovered near the areas of Milliken and Alfalfa. These lands are within the former maneuver area but are also near the Redmond Precision Bombing Range. The rest of Sgt. Silbaugh's interview can be found in the INPR.

Ken Bell
Retired
(503)252-6779

Mr. Bell served as a soldier in the Northwest Maneuver Area in 1943. He remembers firing blanks only. The soldiers were never issued live ammunition. Some soldiers were sent to Camp Adair to fire the rifles on the range. Gas chambers were also present at Camp Adair but not in the maneuver area (they were at Camp Abbot). The aircraft that flew in support of the maneuvers were known to drop bags filled with flour.

Sue Hinton
Sunriver Nature Center
503-593-4394

Ms. Hinton provided the St. Louis District with historical photos, maps and documentation of Camp Abbot, the Headquarters for the Northwest Maneuver Area. Actual pieces of ordnance have been kept and maintained by the Sunriver Nature Center.

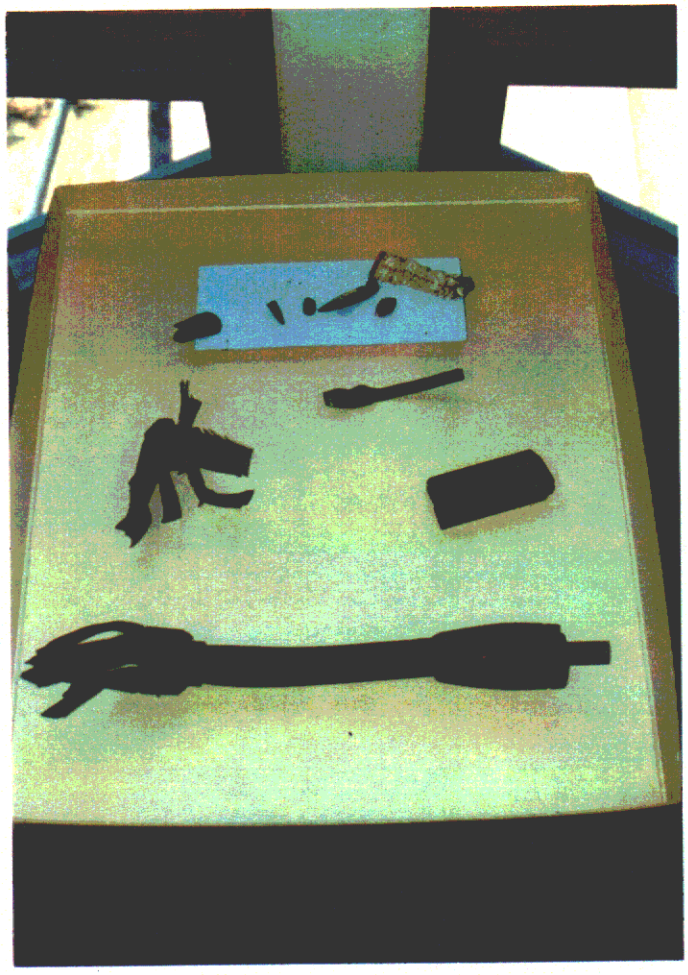
APPENDIX I

PRESENT SITE PHOTOGRAPHS

ORDNANCE AND EXPLOSIVE WASTE
CHEMICAL WARFARE MATERIALS
ARCHIVES SEARCH REPORT
FINDINGS
for
CAMP ABBOT
Deschutes County, Oregon

Project No. F10OR004102

APPENDIX I - PRESENT SITE PHOTOGRAPHS



#1 Ordnance items on display at Sunriver Nature Center.

#2 Grenade spoon located at Grenade Courts.

#3 Bunker at Field Target Range.

#4 Pit/crater in the vicinity of former ordnance storage area.

#5 Additional view of pit/crater.

#6 Foundation with berm located in the ordnance storage area.

#7 Foundations in ordnance storage area.

#8 One of several pits within suspected demolition/assault range.

#9 Concrete pillbox at suspected demolition/assault range.

APPENDIX J

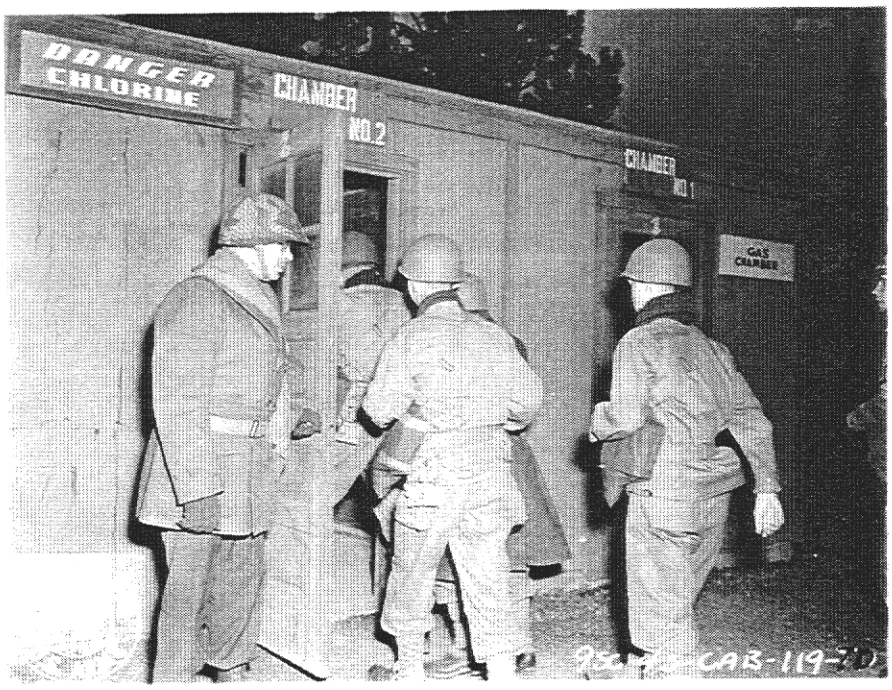
HISTORICAL PHOTOGRAPHS

ORDNANCE AND EXPLOSIVE WASTE
CHEMICAL WARFARE MATERIALS
ARCHIVES SEARCH REPORT
FINDINGS
for
CAMP ABBOT
Deschutes County, Oregon

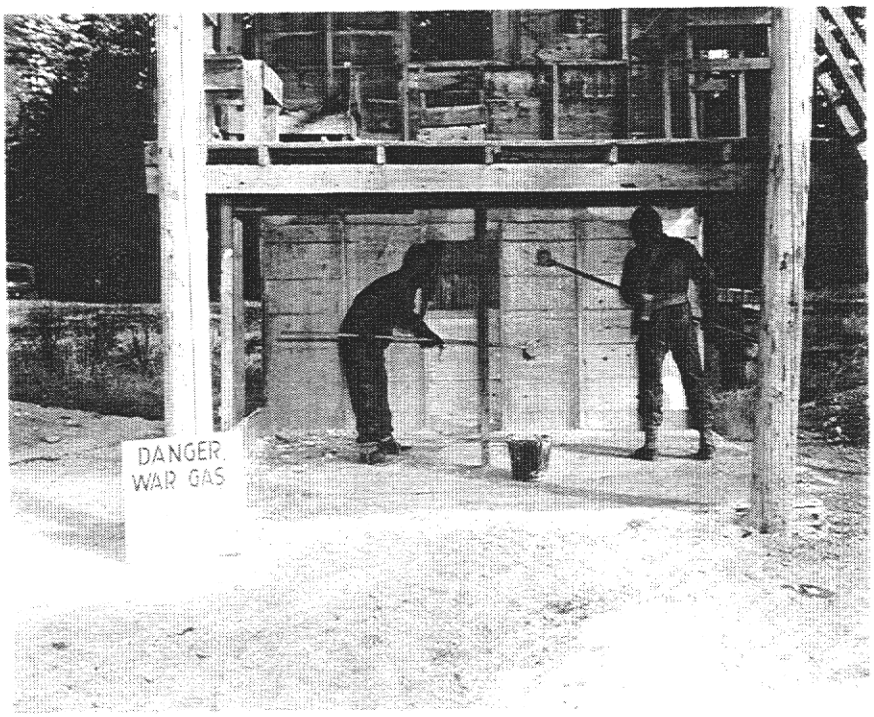
Project No. F10OR004102

APPENDIX J -- HISTORICAL PHOTOGRAPHS

Historical Photograph	Description
HP-1	Soldiers undergoing training in Gas Chamber (1943).
HP-2	Decontamination of chamber (1944).


DANGER
CHLORINE
CHAMBER
NO.2
CHAMBER
NO.1
GAS
CHAMBER

HP-1


DANGER.
WAR GAS

HP-2

APPENDIX K

HISTORICAL MAPS / DRAWINGS
NOT USED

APPENDIX L

SITE SAFETY AND HEALTH PLAN / SITE INSPECTION REPORT

ORDNANCE AND EXPLOSIVE WASTE
CHEMICAL WARFARE MATERIALS
ARCHIVES SEARCH REPORT
FINDINGS
for
CAMP ABBOT
Deschutes County, Oregon

Project No. F10OR004102

APPENDIX L

SITE SAFETY AND HEALTH PLAN/SITE INSPECTION REPORT

Site Safety and Health Plan for Camp Abbot, May 1995

The Site Inspection Report is located in Section 6.0, ASR Findings and Section 2.4, ASR Conclusions and Recommendations

SITE SPECIFIC SAFETY AND HEALTH PLAN (SSHP)
OE/CWM Archives Search Site Inspection Visit
Camp Abbott
Deschutes County, Oregon
Site #F100R004100

1. REFERENCES:

a. Safety Manual, CELMS-PM-M, 16 Sep 93 w/ Ch1.

b. SOP for Reporting Ordnance and Unexploded Ordnance (UXO), CELMS-PM-M, 19 Jan 95.

c. OEW Guidance Regarding Coordination with EOD Organizations, 10 Jan 95.

2. GENERAL: This plan prescribes the safety and health requirements for team activities and operations conducted to determine the presence of ordnance and explosive waste and /or chemical warfare materials at the specified site.

a. The Safety Officer has final authority on all matters relating to safety. The safety rules will be followed at all times. Any member of the team may stop operations if they observe a situation or activity which poses a potential hazard to any individual or to the operation. All actions must comply with the common sense rule!

b. All team members will be aware of the local emergency numbers and the location of the nearest telephone.

c. A minimum of two and a maximum of eight persons will be allowed on-site at any one time.

d. The property owner is not required to sign the SSHP, but should be politely asked to participate in the safety briefing.

3. MISSION: Reconnoiter, document, and photograph areas on Camp Abbott, Oregon suspected to be contaminated with UXO and/or toxic chemical munitions. Camp Abbott is located in Deschutes County, west from the community of Sunriver.

4. SAFETY PRECAUTIONS: All team members will stay within sight of each other while on site. A first aid kit will be on hand. The following three basic safety rules apply at all times:

a. Rule 1 - Do not touch or pick up anything at the site.

b. Rule 2 - Do not step anywhere you cannot see where you place your foot.

c. Rule 3 - There will be no eating or smoking at the site. Hands will be washed after the survey and prior to eating. Drinking fluids should be done during periodic breaks.

5. SITE COMMUNICATIONS: The primary means of communicating with other team members will be by voice. Team members will always remain within sight of each other. Cellular telephones should be carried to facilitate and expedite calling for emergency medical services.

6. NATURAL HAZARDS: The area is forested area, loose soil and fallen trees would constitute the most significant hazard. Wildlife isn't expected to be a problem, remote possibility of encountering a bear, cougar, or timber rattler. Wasp and yellowjacket and of course ticks are the major concern.

7. ORDNANCE HAZARDS: Small Arms, Grenades (hand & rifle), Mortars, Rockets, Mines (tear & anti-tank), Rockets (anti-tank), and Projectiles (various sizes). Hazards include High Explosive, Shape Charge, Frag, and WP.

8. HAZARD EVALUATION: Estimate the overall hazards using the following guidelines: (check appropriate item)

[ ] Low (small arms ammunition)
[ ] Moderate (practice bombs with spotting charge)
[X] High (high explosive munitions, toxic chemicals, WP)
[ ] Unknown

9. EMERGENCY PROCEDURES: First aid will be rendered for any injuries. In the event of a detonation, everyone should freeze until the situation can be assessed by the team leader. Unnecessary injuries can be avoided by not panicking and planning a logical course of action, which may include retracing your steps out of an impact area. Emergency medical services will be contacted by the most expeditious means available.

10. SAFETY STATEMENT: Safety is everyone's business. No unnecessary risks will be taken to obtain photos or other data. Team members are responsible for notifying the project Manager or safety Officer of any physical conditions that may impede or prevent their accomplishment of the mission. An example is allergic reactions to bee stings.

Important Phone Numbers

Emergency:	911
Deschutes County Emergency services:	(503) 388-6502
Deschutes County Sheriffs Office:	(503) 388-6655
St Charles Medical Center:	(503) 382-4321
Huntsville Safety:	(205) 895-1582/1579
	(800) 627-3532, PIN 777-2534
St Louis Corps Of Engineers:	(314) 331-8036
Cellular Phone (Gilmore):	(314) 630-5814
548th EODCT	(206) 967-1971

SSHP reviewed by: William K. James
William K. JAMES

Encls
1. Safety Briefing Attendance
2. Safety gear

SITE SURVEY SAFETY BRIEFING

Date 5/22/95

PPE	**Site Hazards**
✓ Work Clothing	✓ OE
____ Gloves	✓ CWM
____ Hardhat	____ HTW
____ Hearing protection	✓ Slips, falls, trips
____ Safety shoes	✓ Wildlife
____ Safety glasses	✓ Vegetation

Weather Precautions

✓ Cold/Heat
____ Severe Weather

Additional Topics: _____

_____

Safety Briefing Attendance

All team members and any accompanying personnel will be briefed and sign this form:

Print name and organization	**Signature**
DENNIS W. GILMORE CELMS-PM-M	
MICHAEL K. MCCAFFREY "	
C. JOHN DALY CELMS PD-AR	
RANDY FRASER CELMS-PM-M	

MANDATORY MINIMUM SAFETY GEAR

First aid kit (individual)	✓
Survival kit	✓
Fire starter	✓
Space blanket	✓
Whistle	✓
Mirror	✓
Cellular phone	✓
Flash light	✓
Survey tape	✓
Canteen	✓

APPENDIX M

REPORT DISTRIBUTION LIST

ORDNANCE AND EXPLOSIVE WASTE
CHEMICAL WARFARE MATERIALS
ARCHIVES SEARCH REPORT
FINDINGS
for
CAMP ABBOT
Deschutes County, Oregon

Project No. F10OR004102

APPENDIX M -- REPORT DISTRIBUTION LIST

Addressee	No. Copies
Commander, U.S. Army Engineer Division Huntsville, ATTN: CEHND-ED-SY-A P.O. Box 1600 Huntsville, Alabama 35807-4301	2
Commander, U.S. Army Chemical Materiel Destruction Agency ATTN: SFIL-NSM Bldg E4585 Aberdeen Proving Ground, Maryland 21010-5401	1
Commander, U.S. Army Chemical & Biological Defense Command ATTN: AMSCB-CIH, Bldg E5183 Aberdeen Proving Ground, Maryland 21010-5323	1
U.S. Army Technical Center for Explosives Safety ATTN: SMCAC-ESM Savannah, IL 61074-9639	1
Commander, U.S. Army Engineer District, Portland ATTN: CENPP-PE-DC P.O. Box 2946 Portland, OR 97204-3945	1
CELMS-ED-G	1
CELMS-ED-H	1
CELMS-PD-A	1
CELMS-PM-M	1

REPORT PLATES

ORDNANCE AND EXPLOSIVE WASTE
CHEMICAL WARFARE MATERIALS
ARCHIVES SEARCH REPORT
FINDINGS
for
CAMP ABBOT
Deschutes County, Oregon

Project No. F10OR004102

REPORT PLATES

RP-1 Vicinity Map

RP-2 General Layout Map

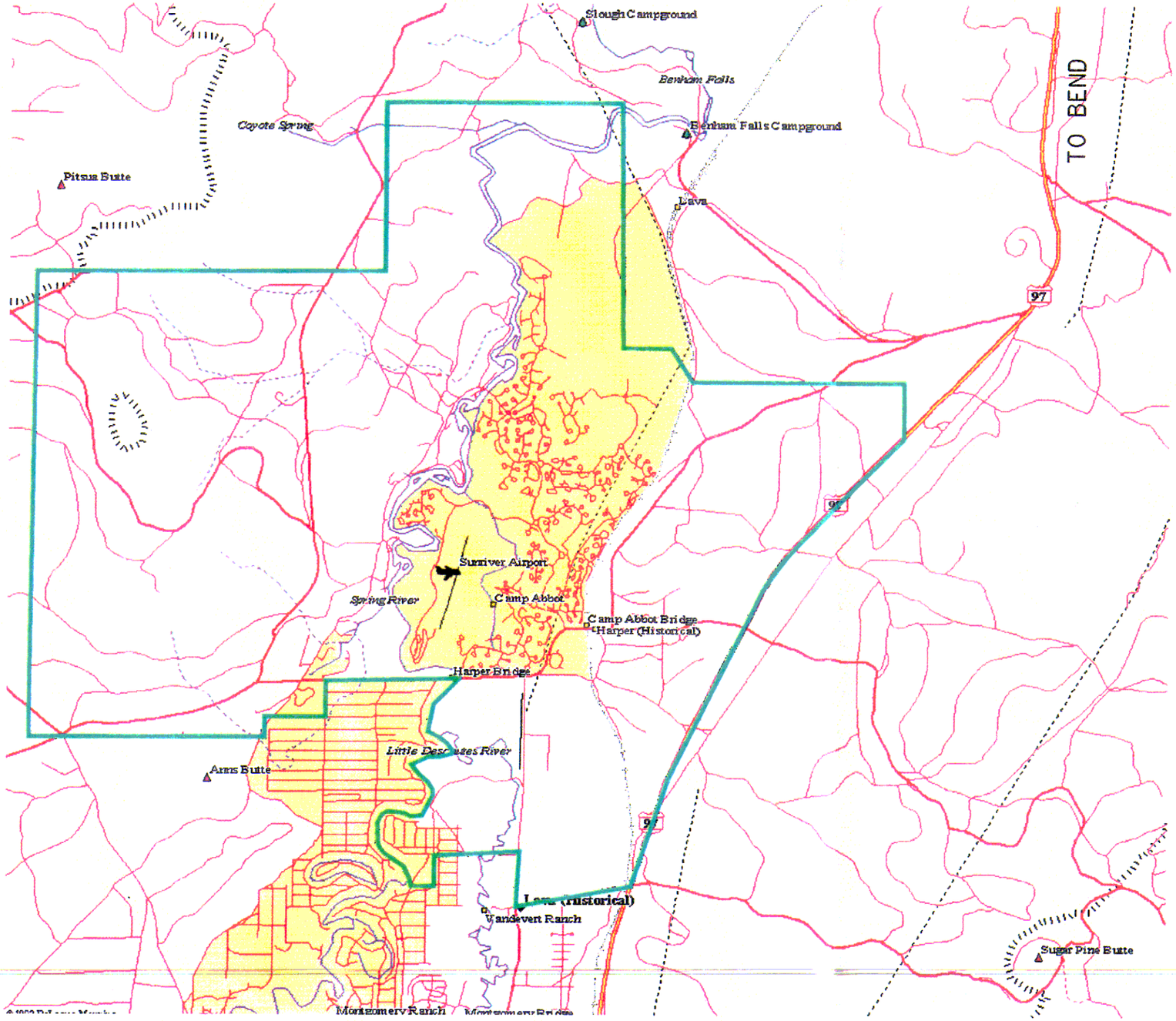
RP-3 Sunriver Resort Current Map

RP-4 Current Map with Range Overlay

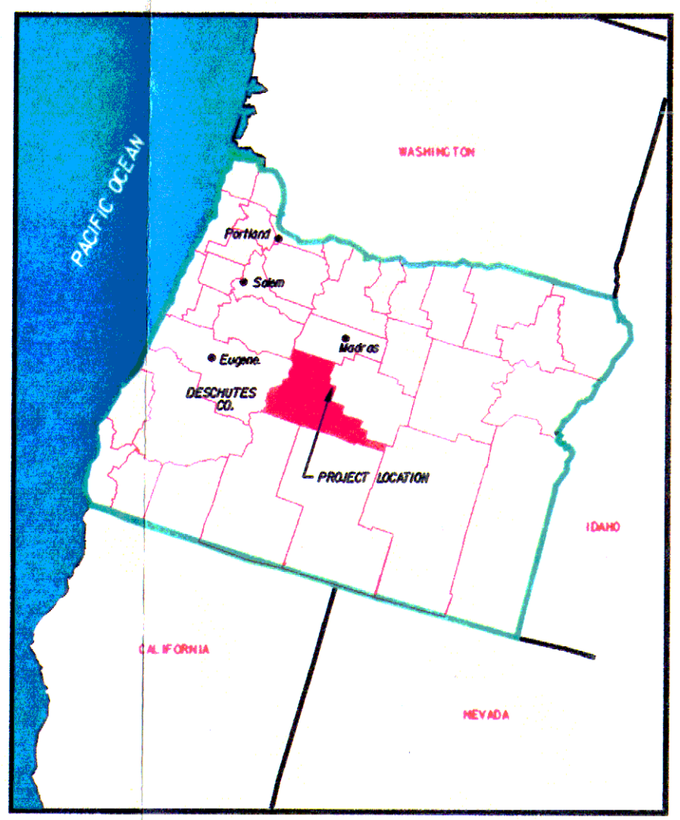
RP-5 Findings

RP-6 Aerial Photo 1951

RP-7 Aerial Photo 1968



SITE BOUNDARY



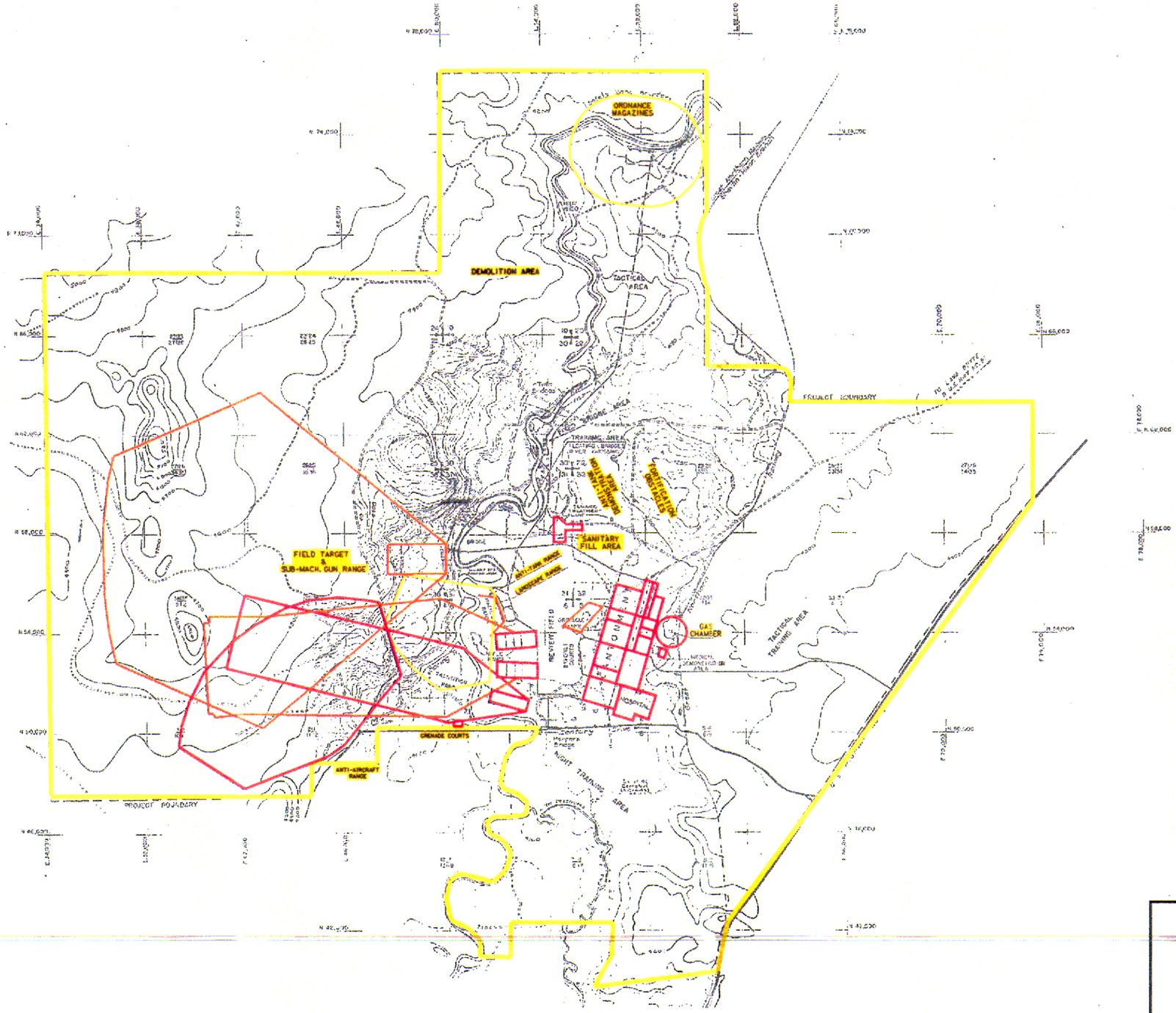
N

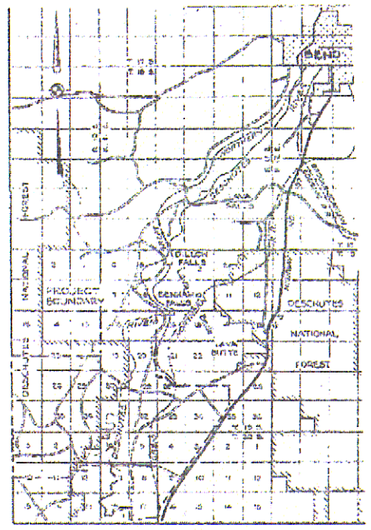
NOT TO SCALE

RP-1

CAMP ABBOT
DESCHUTES COUNTY, OREGON
DERP-FUDS# F10OR004102
VICINITY MAP

PROJ. DATE: JUN 1995	DATE OF MAP: 1993
6-JUN-1995 09:23	/N/OEW95C/G20/MAP/ABBOTVIC.DGN & .EXT





VICINITY MAP
SCALE IN MILES

LEGEND

- ROADS, EXISTING, IMPROVED
- ROADS, EXISTING, UNIMPROVED
- RAILROADS, EXISTING
- PROJECT BOUNDARY LINE
- BUILDINGS, NON-GOVERNMENT, EXISTING
- BUILDINGS, GOVERNMENT
- OUTLINE OF WOODED AREA
- ROCK OUTCROP
- SWAMP
- RAILROADS, AUTHORIZED

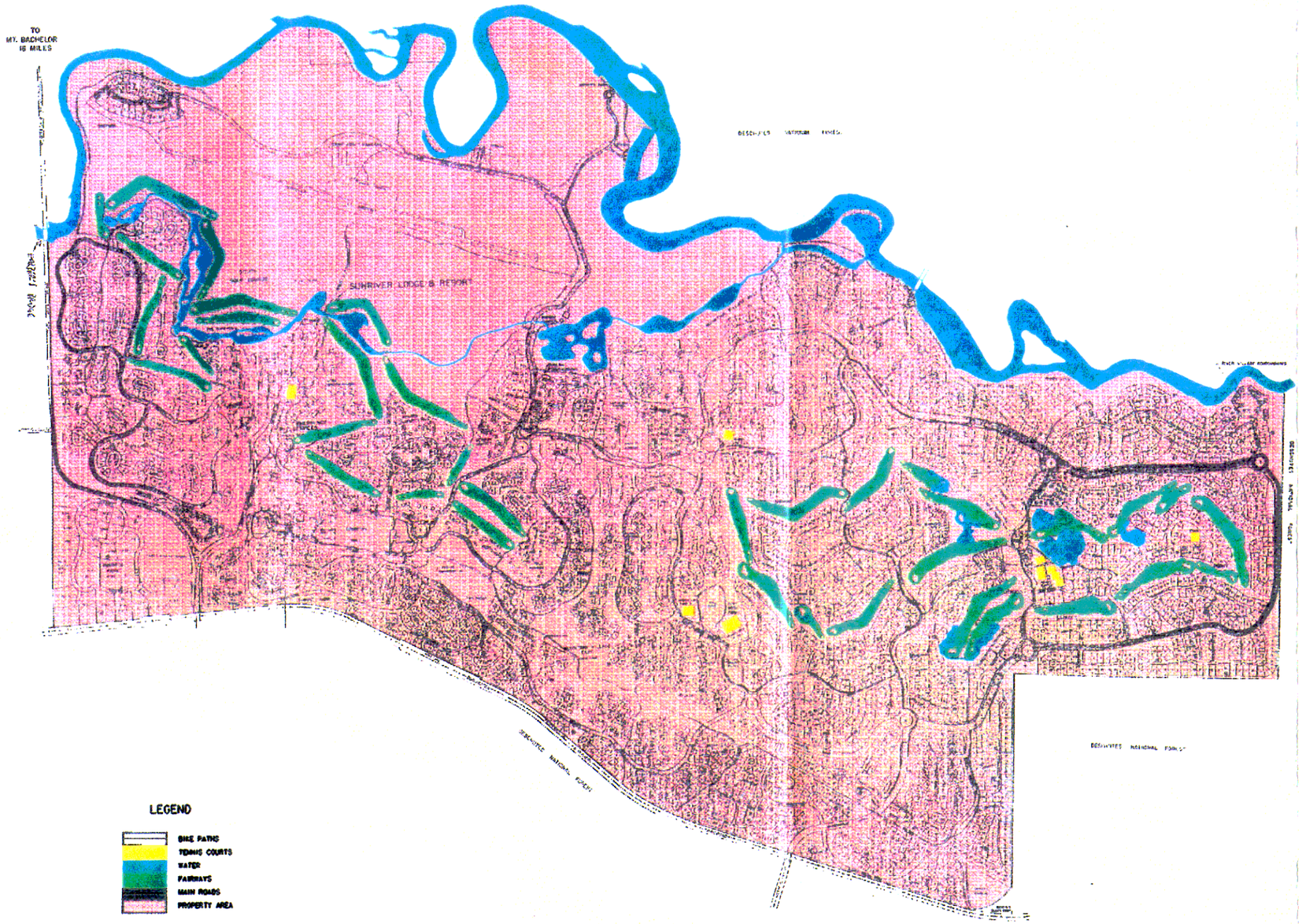
N

NOT TO SCALE

RP-2

CAMP ABBOT
DESCHUTES COUNTY, OREGON
DERP-FUDS# F10OR004102
GENERAL LAYOUT MAP

PROJ. DATE: JUN 1995	DATE OF MAP: 1943
28-JUN-1995 14:12	/N/OEW95/C20/MAP/GENLAY.DGN & LAYOUT.CIT



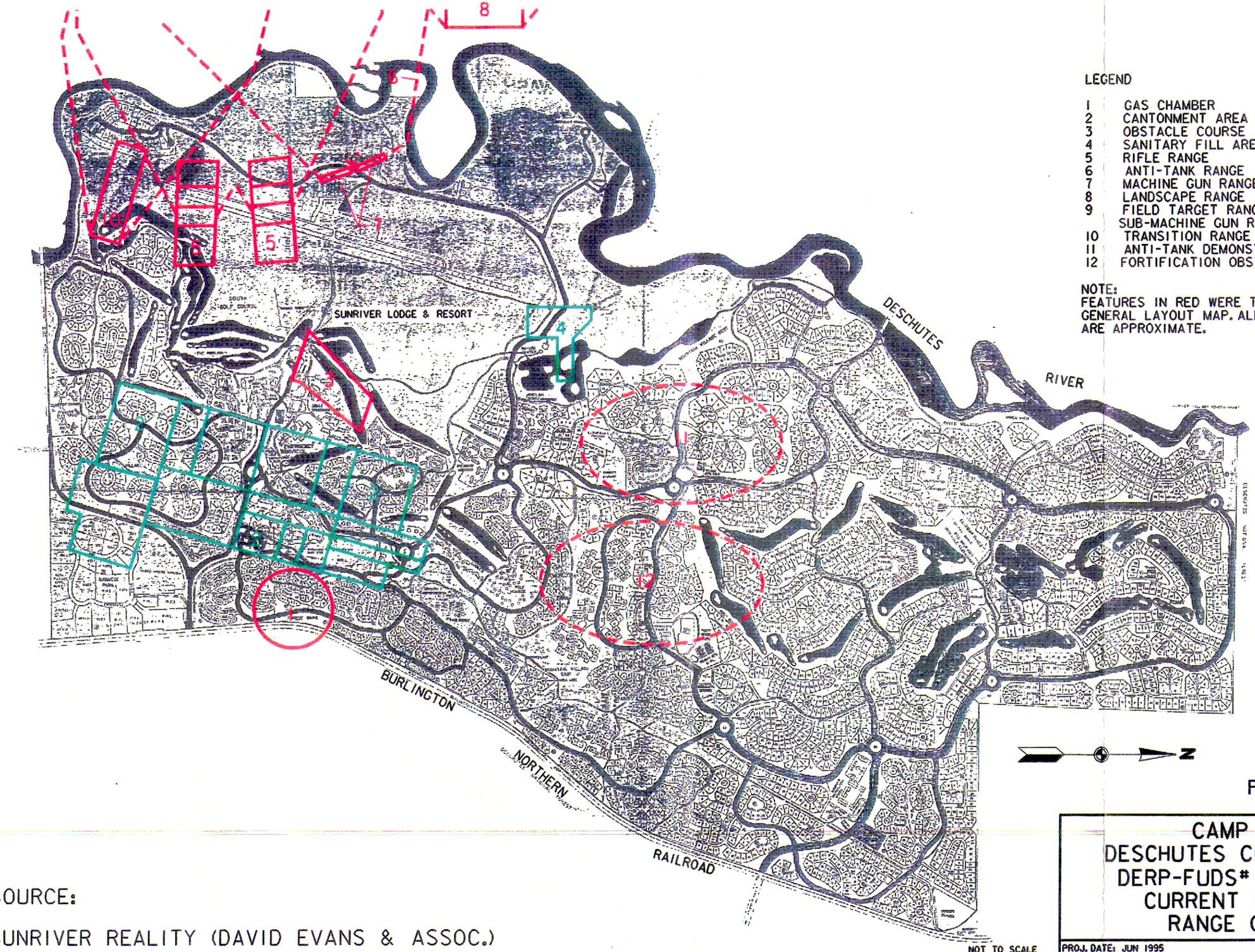
RP-3

SUNRIVER LODGE & RESORT
DESCHUTES COUNTY, OREGON
DERP-FUDS# F10OR004102
CURRENT MAP

SOURCE: DAVID EVANS & ASSOCIATES

NOT TO SCALE

PROJ. DATE: JUN 1995	DATE OF MAP: 1994
23-JUN-1995 13:49	/N/OEW95C/C20/MAP/SUNMAP.DGN - SUNMAP,B,G,Y,CIT



LEGEND

1 GAS CHAMBER
2 CANTONMENT AREA
3 OBSTACLE COURSE
4 SANITARY FILL AREA
5 RIFLE RANGE
6 ANTI-TANK RANGE
7 MACHINE GUN RANGE
8 LANDSCAPE RANGE
9 FIELD TARGET RANGE AND SUB-MACHINE GUN RANGE
10 TRANSITION RANGE
11 ANTI-TANK DEMONSTRATION AREA
12 FORTIFICATION OBSTACLES

NOTE:
FEATURES IN RED WERE TAKEN FROM 1943 GENERAL LAYOUT MAP. ALL FEATURE LOCATIONS ARE APPROXIMATE.

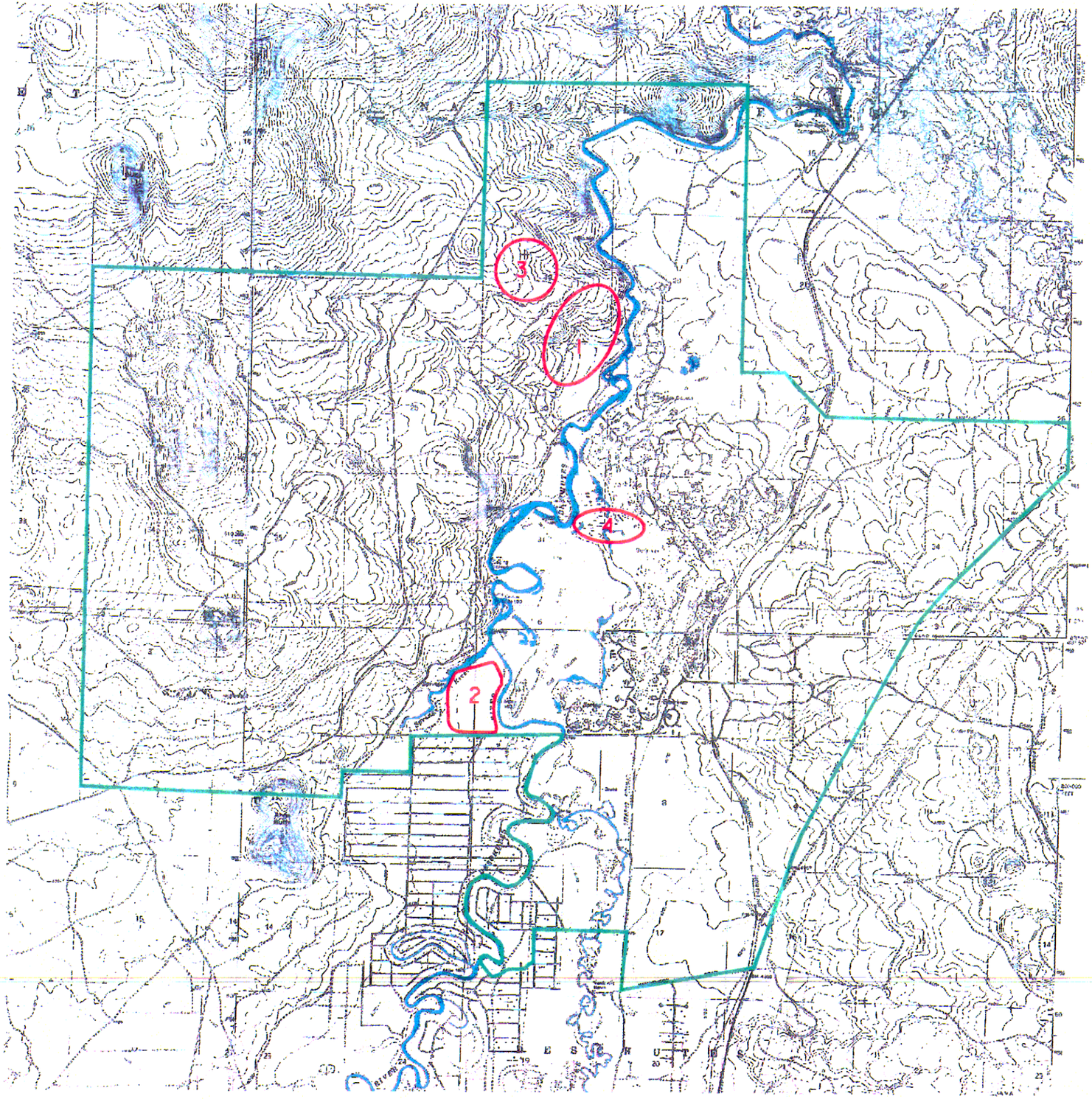
SOURCE:

SUNRIVER REALITY (DAVID EVANS & ASSOC.)

RP-4

CAMP ABBOT
DESCHUTES COUNTY, OREGON
DERP-FUDS* F10OR004102
CURRENT MAP WITH RANGE OVERLAY

PROJ. DATE: JUN 1995	DATE OF MAP: AUG 1993
19-JUN-1995 09:47	/N/OEW95C/G20/MAP/OVERLAY.DGN & SUNRIVER.CIT



LEGEND

SITE BOUNDARY

FEATURE LOCATIONS

1. CLIFFS NORTHWEST OF THE SUNRIVER AIRPORT ACROSS FROM CARDINAL LANDING BRIDGE
2. FORMER GRENADE RANGE
3. SUSPECTED DEMOLITION/ASSAULT RANGE
4. LANDFILL

N

NOT TO SCALE

RP-5

CAMP ABBOT
DESCHUTES COUNTY, OREGON
DERP-FUDS* F10OR004102
FINDINGS

PROJ. DATE: JUNE 1995	DATE OF QUADs: X
12-JUL-1995 13:55	/N/OEW95C/G22/QUAD/ANNSBUTT.DGN, COMPOSIT.CIT

FEATURE NO.	FEATURE DESCRIPTION
1.	FIELD FIRING / TRANSITION RANGE
2.	POTENTIAL ORDNANCE STORAGE AREA
3.	GRENADE COURTS
4.	RANGE COMPLEX
5.	LANDFILL
6.	CHEMICAL TRAINING AREA
7.	ANTI TANK / DEMOLITION / FORTIFICATIONS AREA

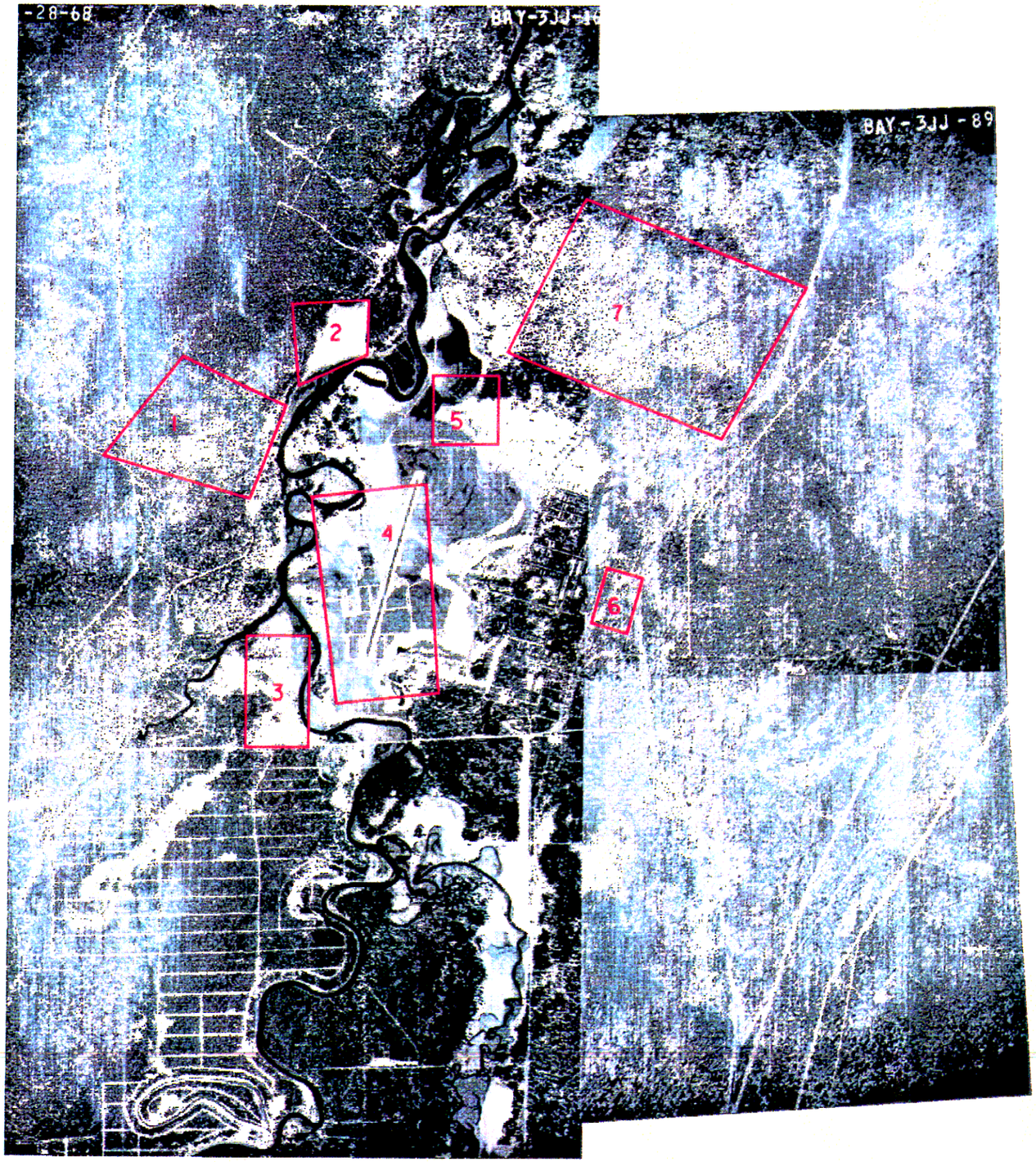
N

NOT TO SCALE

RP-6

CAMP ABBOT
DESCHUTES COUNTY, OREGON
DERP-FUDS* F10OR004102
1951 AERIAL PHOTO

PROJ. DATE: JUN 1995	DATE OF PHOTO: 1951
27-JUL-1995 14:47	/N/OEW95C/G2O/PHOTO/ABB51.DGN-ABB51B,C,D,E.EXT



FEATURE NO.	FEATURE DESCRIPTION
1.	FIELD FIRING / TRANSITION RANGE
2.	POTENTIAL ORDNANCE STORAGE AREA
3.	GRENADE COURTS
4.	RANGE COMPLEX
5.	LANDFILL
6.	CHEMICAL TRAINING AREA
7.	ANTI TANK / DEMOLITION / FORTIFICATIONS AREA

N

NOT TO SCALE

RP-7

CAMP ABBOT
DESCHUTES COUNTY, OREGON
DERP-FUDS# F10OR004102
1968 AERIAL PHOTO

PROJ. DATE: JUN 1995	DATE OF PHOTO: 1968
28-JUL-1995 09:49	/N/OEW95C/G20/PHOTO/ABB68.DGN, SAV - ABB68A,B,D,E.EXT